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PELVIC DISPROPORTION

HISTORICAL—CLASSIFICATION—DIAGNOSIS *

BY

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In these two lectures on pelvic disproportion I suggest that you should accompany me through obstetric history as I attempt to describe the stages by which the knowledge we possess to-day of this interesting subject has been reached.

Historical

Knowledge of pelvic deformities, and obstruction of labour resulting therefrom, was held up well into the sixteenth century by the persistent misconception and teaching that failure of the pelvic bones to separate was the chief cause of pelvic obstruction. Those who wish to read the story more fully than I can tell it should consult Fasbender's history (1906): it is a mine of information on all obstetric questions. Contemporary with Ambroise Paré (1510–90), who, as you will remember, introduced podalic version and thereby revolutionized operative obstetrics, was an Italian obstetrician named Giulio Cesare Aranzio (1530–89). He it was who laid the foundation on which our knowledge of pelvic deformity has been slowly erected. Aranzio was a pupil of the great anatomist Vesalius. In his studies of the pelvis and the mechanism of labour he correlated his anatomical and obstetrical observations. He recommended passing the whole hand into the vagina to determine the degree of pelvic contraction.

Years passed, and then there appeared three great stars in the obstetric firmament—Mauriceau (1637–1709), Van Deventer (1651–1724), and de Motte (1655–1737). All three were famous exponents of practical obstetrics and, in their writings, made important contributions towards elucidating the subject here discussed. Van Deventer of The Hague was the first to draw up a simple classification of pelvic malformations, many of which by his time had come to be identified.

The next obstetric giants to appear were Levret (1703–80) and William Smellie (1697–1763). Levret's name will ever be remembered because of the improvement he introduced in the obstetric forceps—he devised the pelvic curve. Other contributions he made; but, as Fasbender (1906) states, "pelvic pathology was not advanced to any extent by him" (p. 313). Very different was the case in respect to Smellie. To quote Fasbender once again: "Both in respect to the mechanism of birth in contracted pelvis and the forceps operation his name is for ever ensured of a first place" (p. 329). There never was a greater exponent of practical obstetrics than Smellie: his writings are so simple and direct, his observations so exact, his judgment so sound; and, in addition to his great qualities of intellect and technique, what patience and consideration for his patients are evident in every page of his wonderful case records! Other great obstetricians followed, such as Denman (1733–1815), Hamilton (1737–1802), Roederer (1739–63), Baudelocque (1746–1810), Osiander (1759–1822), Saxtorph of Copenhagen (1740–1800) and his son, Stein the elder (1731–1803) and his nephew, Naegele, Robert, and in the United States of America Dewees (1768–1841) of Philadelphia.

The first important monograph on contracted pelvis was that written by Michaelis (1798–1848), although Litzmann (1815–90), his successor in Kiel, actually saw it through the press, following the tragic death of Michaelis. These two names are generally associated. Michaelis's (1851) work initiated a new era in which contracted pelves were studied in greater detail, their aetiology reviewed, and a more extended classification introduced. And this brings me to my second heading—classification.

Classification

The evolution of classification of pelvic malformations followed the natural course. If we begin with Van Deventer, who, as we have seen, presented the first simple classification, we find that alterations in shape without any special consideration for aetiology were the basis. Michaelis adopted this principle, as did Litzmann later in his more elaborate classification (1861). Right down to the end of last century we find leaders in obstetrics such as Dohrn, la Torre, Waldeyer, suggesting classifications based on form of pelvis and concentrating their attention, as did Michaelis and Litzmann, on the mechanical forces affecting the developing pelvis or the pelvis affected by disease.

The first really satisfactory, or might I term it satisfying, classification was presented by Schauta (1889) of Vienna; it was based entirely on aetiology. Later, Breus and Kolisko (1904) modified Schauta's grouping slightly in the classification they presented in the first volume of their monumental work on the pathology of the bony pelvis. The objection that classification based on aetiology gives no indication of shape of pelvis, which is the question at issue in practice, must be admitted; but equally valid is the objection that a classification based on shape gives no indication of aetiology. To attempt to combine both, as in the Tarnier-Budin-Bonnaire (1898) classification,

* The first of two lectures delivered at the British Postgraduate Medical School (University of London) on January 12 and 19, 1939.

leads to a hopelessly complicated grouping. Personally, I think that the five groups of Schauta and of Breus and Kolisko can be compressed with advantage into four, and this I did in the classification which I presented in the first (1908) edition of *Operative Midwifery*. Here is the classification I suggested:

I. *Deformities resulting from faulty development:* (*a*) Justo-major pelvis (pelvis simpliciter seu equabiliter justo-major); (*b*) justo-minor pelvis (pelvis equabiliter justo-minor) or generally contracted pelvis; (*c*) simple flat, non-rachitic pelvis; (*d*) Naegele's pelvis, imperfect development of one sacral ala; (*e*) Robert's pelvis, imperfect development of both sacral alae; (*f*) split pelvis, imperfect development of pubes; (*g*) assimilation pelvis.

II. *Deformities resulting from disease of the pelvic bones and joints:* (*a*) Rickets; (*b*) osteomalacia; (*c*) new growths; (*d*) fractures; (*e*) atrophy, caries, and necrosis; (*f*) disease of sacro-iliac, pubic, and sacro-coccygeal joints; (*g*) subluxation of sacro-iliac joint.

III. *Deformities resulting from disease in spinal column:* (*a*) Kyphosis; (*b*) scoliosis; (*c*) spondylolisthesis.

IV. *Deformities resulting from disease of the lower extremities:* (*a*) Coxitis; (*b*) dislocation of one or both femurs; (*c*) atrophy or loss of one limb.

In formulating a classification there are always some varieties of pelvis which may be placed in one or more groups, or possibly in all groups. For example, Schauta includes assimilation pelvis in the group of "malformations of the spinal column," and it is a malformation of that nature; but as it originates primarily from an "error of development" surely it should be placed in that group. Then Breus and Kolisko place the rachitic pelvis in the group "errors of development"; but here again the primary cause is disease of the pelvic bones, although

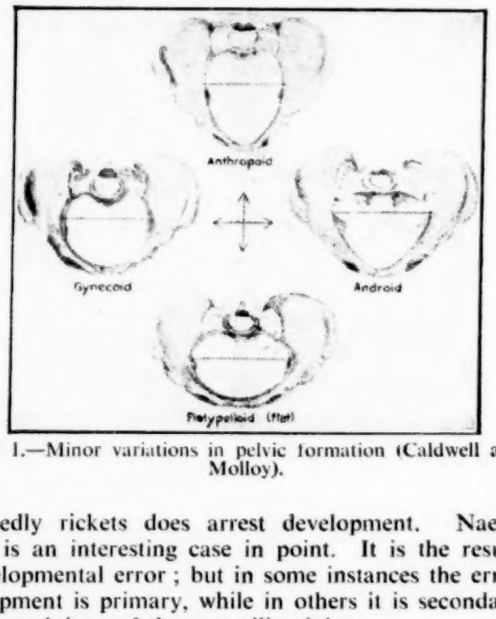


FIG. 1.—Minor variations in pelvic formation (Caldwell and Molloy).

admittedly rickets does arrest development. Naegele's pelvis is an interesting case in point. It is the result of a developmental error; but in some instances the error in development is primary, while in others it is secondary to disease or injury of the sacro-iliac joint.

The types of malformation tabulated in the foregoing classification are familiar to all. They are figured in every obstetric textbook. Classification, however, does not end here; we have now in radiography a new method of examination which, directed to the pelvis, has furnished us with very important additional knowledge. By radiography the recognized varieties, included in all classifications, can be seen and studied with an exactness impossible to visualize from simple vaginal examination. In addition, radiography has revealed that the *pelvis in individuals of normal appearance and figure may show variations from the true female type*: further, that such variations may be influencing factors in the causation of faulty positions and attitudes of the child which may interfere with its birth. Already it has been proved that "malrotation of occipito-posterior positions" of the vertex, and "deep transverse arrest" of head, are in large measure due to minor departures from the normal female form of pelvis. Among the pioneers in this work of classifying minor variations in pelvic formation are Thoms, Caldwell, and Molloy of the United States (Jarcho, 1933).

There is general agreement as regards grouping: (1) gynaecoid, (2) android, (3) anthropoid, (4) platypelloid (Fig. 1). Sir William Turner (1886, 1887), the great anatomist, described such forms, but under a different terminology, fifty years ago as a result of his investigations on pelvic formation. Stein did so also, and earlier than Turner. Thoms rather favours Turner's terminology; but the one here given is likely to be adopted permanently. All give credit to Turner and quote his statement: "With the exception of the skull no portion of the skeleton presents greater individual variations than the pelvis." The same investigators further point out that there are many variations in which the pelvic formation shows a combination of one or more of the parent types—for example, gynaecoid-android or android-anthropoid, etc.

Diagnosis

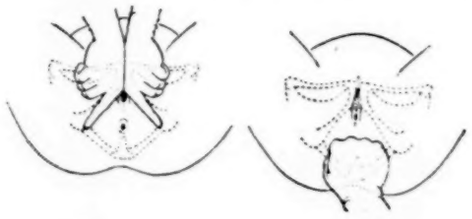
The methods employed for measuring the pelvis are manual, instrumental, and radiographic, and they were introduced into obstetric practice in the order given. A concise and judicial review of these methods appeared as a leading article, entitled "Are Pelvic Measurements Worth Taking?" in the *British Medical Journal* (1938, **2**, 291). Before routine examination by these methods is carried out, however, attention should be directed to the following: (*a*) general appearance and facies, (*b*) height, (*c*) vertebral column, (*d*) formation of the rhomboid of Michaelis, (*e*) length and shape of lower limbs, (*f*) gait, (*g*) contour of abdomen in the standing and supine positions, and (*h*), if the patient has had a previous birth, the nature of the delivery.

Manual Pelvimetry

We have seen that Aranzio first suggested the use of the whole hand. This method was elaborated by Johnson, a pupil of Smellie, and by Ramsbotham many years later. The only manual method which has stood the test of time and is still employed universally is that described by Smellie—the taking of the oblique conjugate by passing the forefinger into the vagina until its point reaches the promontory of the sacrum and then marking off with the thumb of the same hand or the forefinger of the other hand the lower margin of the subpubic ligament. Baudelocque later recommended the employment of the forefinger and middle finger. By deducting half to three-quarters of an inch one gets approximately the conjugata vera, the objective of the examination. Exactness, however, is not possible because the amount to be deducted varies with the angle and depth of the symphysis and the nature and height of the promontory. The latter is the more important disturbing factor as a rule. Not infrequently, especially in rachitic pelves, there exists a high or a low "false promontory": in the former the last lumbar and in the latter the first sacral vertebrae may be felt as the most projecting point instead of the angle marking the junction of the lumbar and sacral vertebrae or true promontory. Again, a high or low "assimilation pelvis" (a very common malformation) may upset one's calcula-

tion. In the former, as you remember, there are six sacral vertebrae (one being borrowed from the lumbar set), consequently the promontory is higher; whilst in the latter there are four sacral vertebrae (one being given to the lumbar set), and consequently the promontory is lower. Obviously these variations markedly affect the inclination of the pelvic inlet, and, if present, have to be taken into consideration when estimating the conjugata vera from the diagonal conjugate. Then there are possible errors in technique: the middle finger against the sacrum may not be pressed against the true promontory, the two fingers may not be kept rigid, or the forefinger of the left hand marking the lower margin of the symphysis may not be exactly applied.

The experienced obstetrician, and especially if he makes the examination under anaesthesia—in a primigravida it is almost impossible to do this satisfactorily except under anaesthesia—can estimate the conjugata vera to within a very small fraction of error. Further, he can estimate inclination of inlet, a matter of considerable importance as it influences engagement of the head. With his fingers also he can determine undue flattening or curving of the



A B

FIG. 2.—A: Measuring the subpubic angle. B: Measuring the outlet with the hand.

sacrum, and by sweeping them round the brim he can form a very fairly correct estimate of the width of the pelvic brim. Then with respect to the lower cavity and outlet he can feel the ischial spines and gauge the size of the sacro-sciatic notch. Finally, with his fingers or his fist applied externally he can judge the capacity of the transverse diameter of the outlet and the subpubic angle (Fig. 2). It will be observed, therefore, that much can be learned from a careful manual examination of the pelvis.

Instrumental Pelvimetry

Pelvimetry by instruments was introduced by Baudelocque and Stein (the elder). Baudelocque's name is associated more particularly with the measurement of the external conjugate diameter—the distance from the point below the last lumbar vertebra (upper angle of Michaelis's rhomboid) to the front of the symphysis pubis. To arrive at the conjugata vera from this measurement one has to deduct 3½ inches. It would serve no purpose to discuss what has been written regarding the value of the external conjugate in assessing conjugata vera.* It is generally accepted that as the amount which has to be deducted varies so much, the *external conjugate measurement should only be given consideration along with other measurements*—for example, oblique conjugate, interspinous, and intercristal—in assessing capacity of pelvis and the conjugata vera. This one can say, however—that if the external conjugate is under 7½ inches there will usually be found some malformation; and if above 7½ inches malformation is unlikely, although in the kyphotic and the anthropoid pelvis the external conjugate may reach or exceed 8 inches.

* In the last two years the subject has been freely discussed in both the *Lancet* and the *British Medical Journal*.

The intercristal and interspinous diameters should be taken as a matter of routine. If they are of normal length and the external conjugate is normal in length there will seldom be any diminution in the internal diameters of the true pelvis. On the other hand, if these diameters are slightly below normal, that does not necessarily imply a diminution in the capacity of the true pelvis: the "splay" of the iliac bones varies greatly. If the two diameters are equal and lessened, flattening of pelvis is suggested.

Stein concentrated his ingenuity on internal pelvimetry. You are familiar with the instrument employed by the shoemaker to measure your foot; well, Stein's instrument was on that principle, and many other obstetricians have suggested pelvimeters of a similar pattern: the last to do so, so far as my memory goes, was Zweifel. Others suggested the scissors form with a scale attached near the handles, so that, when they are separated and the knob at the end of each limb is placed one against the promontory and the other against the internal surface of the symphysis, the distance between these two points can be

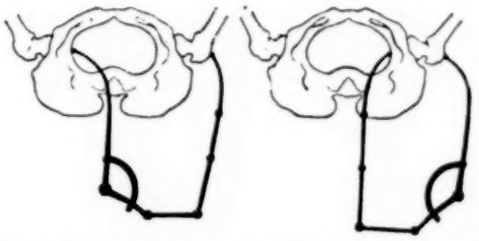


FIG. 3.—Measuring transverse diameter of pelvic inlet with Skutsch's pelvimeter. (The measurement in the right figure is subtracted from the measurement in the left figure.)

read off on the scale. DeLee (1938a) still uses such an instrument—mostly for taking the measurements of the outlet, but also for taking the transverse diameter of cavity, and in some instance of inlet. So far as I am aware Herbert Spencer (1929) was the last to invent a pelvimeter.

And this brings me to say a word or two about mensuration of the transverse diameter. Attempts to measure this particular diameter were a later development. Although several obstetricians made attempts to design an instrument for this purpose, the only one which ever "caught on" among obstetric specialists was that designed by Skutsch. It consisted of two arms, one rigid and the other flexible. The accompanying figure is self-explanatory (Fig. 3). Reference must be made also to the "pelvigraph" of Neumann and Ehrenfest. This ingenious instrument was devised and the two limbs of the instrument manipulated so that a graphic outline of the pelvis (sagittal plane) could be obtained and traced out on a sheet of paper. Dougal (1913) of Manchester devised a much simpler type of "pelvigraph."

As one who lived through the era of instrumental internal pelvimetry I can confidently state that all of us were disappointed with the results obtained. But this statement regarding internal instrumental pelvimetry applies to mensuration of brim and cavity. The outlet, on the other hand, can be measured with great exactness by means of small callipers, of which there are many patterns; as we have already seen, it is also possible with hands alone.

Estimation of Relative Size of Foetal Head and Maternal Pelvis

By the end of last century a new method of examination was introduced—namely, the estimation of the relative

size of foetal head and maternal pelvis. It prompted Barbour's famous aphorism, "The foetal head is the best pelvimeter." This method of examination was initiated by Leopold of Dresden and Pinard of Paris, who, it may be recalled, were the pioneers of abdominal palpation as practised to-day. In respect of contracted pelvis they estimated overlap of head by external methods. Then came Müller, who recommended the use of the two fingers in the vagina to test degree of descent of the head when pressed into the pelvis by an assistant (later by the operator himself by means of his other hand).

In 1902 I made the suggestion that the thumb of the hand whose fingers are introduced into the vagina should be pressed along the brim of the pelvis to determine more exactly position of head and degree of overlap (Fig. 4).

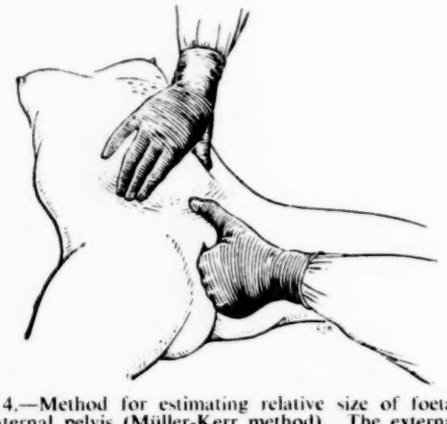


FIG. 4.—Method for estimating relative size of foetal head and maternal pelvis (Müller-Kerr method). The external hand may materially alter the attitude of the head (*see* text).

In a correspondence I had with Koenig (1903), who was at one time Müller's assistant, he admitted that Müller had never stressed employing the thumb used as I suggested —which in my experience is the most important detail in the examination. So I have always contended that this method, which has been in general use for many years, should in justice to us both be associated with our two names. That, however, is a matter of little consequence.

By this method of examination, and especially if it is carried out under anaesthesia, it is possible in "borderline" cases to predict *early in labour*, and with great accuracy (6 to 8 per cent. error), whether the head will or will not pass through the pelvic brim—given, of course, good strong uterine contractions. *The same degree of accuracy, however, is not possible at the thirty-sixth week of pregnancy* (when the examination is generally made for the first time), because between the thirty-sixth week and the onset of labour changes occur in the soft parts and in the pelvic joints which materially alter and lessen the resistance to the head. Further, until the membranes rupture it may be impossible to say in some instances what attitude the head may assume and the adjustments of head to pelvis that may take place. Nor can you tell, until labour is well established, the strength of the uterine contractions.

I would direct your attention to one very important point in making this bimanual examination. When the head, which is almost always lying transversely at the pelvic brim, is grasped in its antero-posterior diameter between thumb and fingers and pushed into the pelvic inlet the biparietal obliquity existing may be increased or altered. If by pressure on the head an anterior obliquity (posterior parietal presentation) is produced or increased there results a marked degree of overlap; while if a posterior obliquity (anterior parietal presentation) is produced or increased there may be—generally will be—no overlap. Thus the state of matters may be made to appear in the former event worse and in the latter event better than is actually the case (*vide* remarks, in my second lecture, on management of trial labour).

Radiographic Pelvimetry and Foetal Cephalometry

It is accepted as a first principle in medicine and surgery that diagnosis should be as exact as possible, and that every new method of examination, once it has been proved, should be invoked for this purpose. Among the more recent methods introduced is radiography. It has been welcomed and is extensively employed by physicians and surgeons as an aid to diagnosis. Yet to-day, although it has been proved that a picture of the pelvis can be obtained by radiography more exact than can be constructed by any other means, there are those practising obstetrics, and familiar with the complications encountered, who are lukewarm to its routine employment for the specific purpose we are discussing—namely, diagnosis of formation and mensuration of the pelvis. Now, why should this be? A radiograph of the pelvis has only to be taken once in a woman's life-time, the cost need not be great, and only the comparatively few living in some remote locality would be put to any inconvenience. It is the same old story—opposition to any precautionary procedure that magnifies the seriousness of childbirth, and satisfaction with existing conditions. In the forty-odd years I practised obstetrics I witnessed opposition to a more thorough employment of antiseptics, to the use of rubber gloves, to the wearing of masks, to a more thorough ante-natal supervision, to institutional treatment in preference to domiciliary treatment, and to permitting any qualified practitioner to practise obstetrics irrespective of the training he has undergone in obstetrics. It is also true, however, that I have seen many of these walls of opposition razed to the ground, as will happen in course of time to the others mentioned.

I do not think that, with the knowledge now to hand regarding the influence exerted by even minor variations of pelvic formation, we who advocate routine pelvic radiography for all primigravidae have lost our sense of proportion in this matter, as many suggest to-day. On the contrary, I make bold to predict that before many years pass it will be accepted as an essential detail of the ante-natal examination. In support of this contention let me present two imaginary cases.

Case 1: The radiograph shows a typical female pelvis of normal capacity.—Here the presentation in 80 to 90 per cent. of cases will be a first or second vertex; but should an occipito-posterior position develop there need be no concern, for almost certainly long rotation will occur. A face or brow presentation is most unlikely, as also is prolapse of the cord. If at the thirty-sixth week a breech presentation is discovered, and even if the legs are extended and external version is unsuccessful, there need be no cause for concern regarding the delivery: in all probability it will be quite easy. Further, in almost all cases vaginal examination during labour can be dispensed with—the vaginal examination at the thirty-sixth week will have supplied all necessary information.

Case 2: The radiograph shows a pelvis of abnormal formation, but not of a gross type obviously necessitating Caesarean section.—Here anything may happen: occipito-posterior position in a large number of cases and the probability that it will take the short rotation and become "persistent." Face or brow presentation and prolapse of cord are not improbable, while if the presentation is a breech and cannot be converted there will certainly be difficulty in delivering the after-coming head.

Knowledge of possible difficulties at the delivery furnished by a radiograph should not make you unduly anxious or "panicky"; but it should cause you to be particularly watchful of that patient. Further, such a patient should have her confinement in an institution. My claim is that by having a radiograph taken at the thirty-sixth or thirty-seventh week—or early in pregnancy, as some claim is an advantage*—you are prepared for possible complications arising during parturition; they do not come as surprises. To my mind the only objection to meticulous antenatal supervision, including a radiograph of the pelvis, is that it may "rattle" the patient. In my experience, however, patients are not "rattled" by doctors who show attention to details; the doctor who annoys them and loses their confidence is the one who is casual.

Continuing to trace out developments in historical sequence, I would remind you that Budin (1897) and Albert (1899) were the first to suggest employing radiography for the purpose of pelvimetry. After reading their communications I induced the late J. R. Riddell (1907)—the leading radiologist in Glasgow at the time—to take the matter up, which he did. He published a paper on the subject and wrote a few pages for the first edition of my *Operative Midwifery* (1908); but I could not persuade him to pursue his investigations, although we were both convinced of the possibilities of pelvic radiography.

The difficulty in devising a technique which would ensure exactness in mensuration, but chiefly the fact that

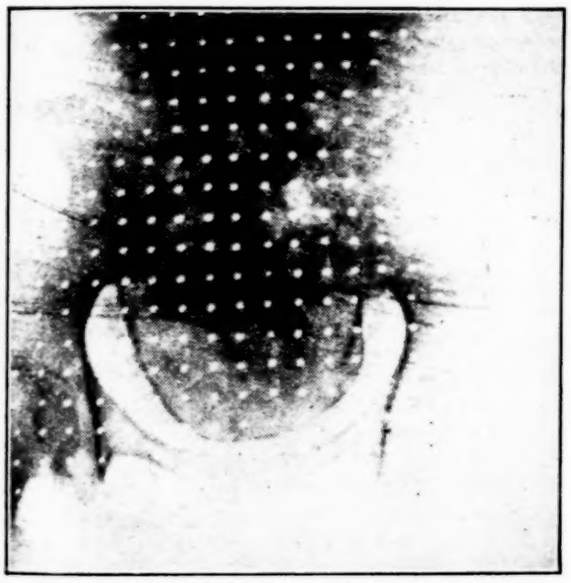


FIG. 5.—Pelvic radiograph, with exposure of lead plate superimposed. Diameters of inlet are measured by counting the number of spaces between perforations, each of which represents 1 cm. (Jarcho, *The Pelvis in Obstetrics.*)

none of our maternity hospitals possessed an *x*-ray department until quite recently, were serious handicaps; indeed, obstetricians in this country are indebted to radiological specialists such as Roberts, Rowden, and Reece for "keeping up our wicket" in this field of investigation. Thoms (1925), recognized as the pioneer of pelvic radiography in the United States of America, introduced a method which he has gradually improved, and which is admitted to be one of the best, if not the best, yet devised (Fig. 5). Roberts (1927) and Rowden (1931, 1935, 1937), in this country, have suggested methods. Rowden's can be carried out with the simplest of equipment, as you can judge from the description he kindly supplied for the last edition (1937) of my *Operative Obstetrics.* The method recently described by Orley (1938) is based on that of Thoms, and can be very easily carried out.

You are probably familiar with Thoms's method and its technique; permit me, nevertheless, to repeat its essentials. The patient is placed reclining on the couch with shoulders raised—an adjustable table is very useful. The purpose is to get the pelvic inlet or superior strait exactly horizontal, so that the rays from the tube strike it at right angles. The boundaries of the brim are very nearly on one plane; the slight lateral dip is negligible with the tube distance now in use. Under the patient's pelvis is placed a Potter-Bucky diaphragm with the sensitive plate. The tube is centralized and the exposure made. The patient then rises from the table, and a perforated metal grid, with the perforations 1 cm. apart, is placed at the level previously occupied by the pelvic brim when the patient was in position. A second exposure is made, resulting in a picture of the pelvic inlet and the perforations superposed, from which one can read off the formation and measure with exactness any diameter of the pelvic brim. To determine formation and size of cavity, however, a lateral radiograph is necessary, and this can be best taken with the patient standing. From it one can judge formation of promontory, inclination of brim, length of conjugata vera, also formation and curvature of sacrum and coccyx and size of sacro-iliac notch. Thoms (1937, 1939) has recently described his method. A further advance has been made in the Sloane Hospital for Women, New York, by Caldwell and Molloy (1938). They now employ a special stereoscopic method, which they refer to in their paper. (The outfit can be seen at the Obstetrical Department, L.C.C. Hospital, Hammersmith.) However excellent this and other stereoscopic methods may be, they are obviously not practicable, in the meantime at least, for routine examination.

For all practical purposes enough information is obtained from the ordinary antero-posterior radiograph of the pelvic brim, in conjunction with an examination of the lower pelvis and outlet by hands and pelvimeters. At the moment the following routine is feasible and advisable. (1) Examination of pelvis by ordinary manual and instrumental methods. (2) If there is any departure from the normal suspected, an antero-posterior radiograph of the pelvic brim should be taken. (Personally, I advocate this as a routine procedure in all primigravidae.) (3) If this radiograph shows a distinct variation from the normal female type a lateral radiograph should be taken.

Radiographic Cephalometry

So far I have said nothing about radiographic cephalometry—the measuring of the foetal head by radiography. We have seen that the pelvis can be measured with absolute exactness by this means. Not so the head, however, even if Reece's (1935) calculations are employed—and he has given the subject great consideration. It would be so satisfactory to be able to say "the pelvis is so and so" and the foetal head is "so and so," therefore it will pass through or it will not pass through the pelvic brim and cavity. Unfortunately in "borderline" cases—and it is they we are considering at the moment—this is not and never will be always possible *before labour,* even with the most perfectly executed radiograph of pelvis and foetal head in front of our eyes. The moulding the head may undergo, the adjustments of it to pelvic formation

* The pelvis can be best radiographed early in pregnancy—there is no danger to the foetus. On the other hand, if the radiograph is taken in the thirty-sixth or thirty-seventh week abnormalities in presentation, position, and attitude of the foetus can be observed and a quite satisfactory estimate of pelvic capacity made.

that may take place, and the degree of "give" in the pelvic circumference can never be predicted with certainty. Radiography and careful manual and instrumental pelvimetry combined will reduce the number of borderline cases—in other words, we will be able to predict with a greater degree of certainty whether the head will or will not pass through the brim and well down into the cavity. It will be noted that I do not include the *outlet*; that is a problem of its own to which I intend to refer in my second lecture. Let me quote here what DeLee (1938b) says:

"Therefore while developing a 'roentgen eye' don't fail to confirm what you see with it with what you see with the 'obstetric eyes' on the tips of your fingers. Then, also, don't forget that the pains are the most important element in a labour and only labour itself can tell you how much they are able to do."

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In compliance with the requirements of a gift under the will of the late Francis Amory of Beverly, Massachusetts, the American Academy of Arts and Sciences offers a prize for outstanding work with reference to the alleviation or cure of diseases affecting the human genital organs, to be known as the Francis Amory Septennial Prize. The gift provides a fund, the income of which may be awarded for conspicuously meritorious contributions to the field of knowledge "during the said septennial period next preceding the award thereof, through experiment, study, or otherwise . . . in the diseases of the human sexual generative organs in general." The prize may be awarded to any individual or individuals for work of "extraordinary or exceptional merit" in this field. If there is work of a quality to warrant it the first award will be made in 1940. The total amount of the award will exceed 10,000 dollars, and may be given in one or more awards. It rests solely within the discretion of the Academy whether an award shall be made at the end of any given seven-year period, and also whether on any occasion the prize shall be awarded to more than one person. While there will be no formal nominations, and no formal essays or treatises will be required, the committee invites suggestions, which should be sent to the Amory Fund Committee, care of the American Academy of Arts and Sciences, 28, Newbury Street, Boston, Massachusetts, U.S.A.

OCCUPATIONAL AND ECONOMIC FACTORS OF MORTALITY *

BY

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The reports of the Commissioners for inquiring into the Conditions of Large Towns and Populous Districts were made more than ninety years ago. It is known that Edwin Chadwick wrote much and inspired more of their contents, and some of the minutes of evidence have a macabre force which should appeal to many literary tastes. But neither Chadwick's fame nor the sensational evidence causes the dust on the volumes to be much disturbed. A modern pessimist might draw some comfort from these ancient documents.

The housing conditions of, say, Whitechapel leave something to be desired in 1939, but a "man of the name of Sculley" who lived in Whitechapel in 1844 paid 1s. 3d. a week for the use of a cellar which he inhabited with his wife and five children. He said: "I had some difficulty in procuring any sort of lodging for my large family. "I would willingly pay from 6d. to 9d. per week more if water was laid on in my room." Then a neighbour of Sculley's, a widow, had the misfortune to lose a son who died in a blind asylum. As the corpse could not be brought home for the funeral—the stairs were too narrow—a friend "kindly consented to allow the body to be brought to her room, where her children were playing about: she and her family, consisting of seven in all, were obliged to huddle together to sleep in a small back room."

I stumbled on these domestic details of the golden age of Queen Victoria when I was looking for Dr. William Augustus Guy's evidence upon the influence of employment on health. Guy is a famous name in statistical circles, and this must be almost the first evidence of a statistical character dealing with the general subject of occupation and health taken by an official body. The effect of employment, or exploitation, on children had been officially considered much earlier; Guy was dealing with the health of adults, particularly the factors of pulmonary tuberculosis in some trades. His statistical data were not extensive, although his use of them was judicious. He concerned himself much with the printing trade, which in our own day has come under scrutiny for reasons similar to those which appealed to Guy. I think we must reckon William Farr, writing seven years later in the fourteenth *Annual Report of the Registrar-General*, to have made the pioneer contribution to our subject. Farr began by saying that investigations of rates of mortality in different districts had shown how greatly health and life are affected by local influences.

"The professions and occupations of men open a new field of inquiry, on which we are now prepared to enter, not unconscious, however, of the peculiar difficulties that beset all inquiries into the mortality of limited, fluctuating, and sometimes ill-defined sections of the population."

Measurement of Occupational Mortality

The notion of measuring the mortality of an occupation by taking the ratio of occupied persons who die in their vocation to the number of occupied persons is a simple one. The occupations of the people had interested census-takers long before 1851, and after 1839 death certificates had recorded occupational particulars of most male and some female decedents. But to pass from a simple arm-

* Passages from a Chadwick Lecture given on February 28, 1939.

chair notion to effective practice was to take a long step. Only a man imbued with cheery self-confidence would have taken it, and, as we shall see, even he walked warily. The difficulties are indeed so numerous that a complete enumeration would be discouraging and useless, because some of the difficulties have been surmounted. It will be best to begin with those which governed Farr's original procedure.

Before 1841 the local officers responsible for the census-taking themselves assigned the occupations; they were provided with lists erroneously supposed to be complete, and their duty was to allot persons to the appropriate headings. In 1841 the householder himself assigned his occupation and that of other members of his household. This meant that the specification was probably more accurate, having been made by those in the best position to know the truth. "The result was that many occupations were returned that will not be found in the list in 1831, while in the instance of important manufactures minute subdivisions of labour were separately entered in the schedules, showing both the attention with which this part of their duty was performed by the enumerators, and the absolute necessity for after-combination upon some uniform system." The published tables of 1841 simply classified by age into under 20 years, 20 and over. Occupations (not far short of 1,000) are shown in alphabetical order, tripe dealer coming next to trunk maker. Some reflections on the rise and fall of occupations are suggested by the facts that in 1841 there were 12,824 coachmen, coach guards, and post-boys (aged 20 or more), 1,869 railway servants (exclusive of clerks and engineers), and *one* aeronaut. (He had perished or adopted another profession before 1851.) The occupations are condensed into a small number of groups for general tables.

In the report of 1851 age tabulation is carried much further—to quinquennial grouping. "for without this information the relative salubrity of the professions and a great variety of important questions cannot be determined"—and the hundreds of occupations are ranged into fifteen classes; "at the head of the FIRST CLASS stands HER MAJESTY THE QUEEN," while the fifteenth and last class consists of labourers and mechanics.

There is a soupçon of literary predilection in the ranging of classes, and much more than a soupçon of intrinsic Farrism in the comments upon class characteristics. Thus we are told of the tenth class (which comprises persons employed about *animals*, whether training them like horse breakers, curing them like veterinary surgeons, or killing them like fishermen and rat catchers) that they are altogether "a peculiar race of men; silent, circumspective, prompt, agile, dexterous, enduring, danger-defying men generally."

Farr's System of Classification

But the scientific intention is clear enough—namely, to bring like occupations together. To carry the story of classification further, it may be said that Farr's system survived him by more than a generation. The classes used, for instance, in the Census of 1911 only differ in detail from those of 1851, the first three not even in detail. The system had two defects, both of which Farr perceived, and both of which can be illustrated on Class II: Defences of the Country. This includes both officers and privates—that is, persons of widely different economic and social status. Again within the same subclass, whether of officers or privates, are brought together persons whose occupations are very unlike. A professor of mathematics in the Royal Military Academy, a cavalry officer, an engineer officer, and a commander of a battalion of infantry are all Army Officers, but the dissimilarities of their ways of life may be greater than their resemblances. The former defect is the less important when subdivision is possible, but the second is serious. Of course, in the particular case I have chosen exact information could be obtained, but that is not always possible.

Industrial or Occupational?

In general it is easier to classify industrially than occupationally. Every man knows the name of his employer, and if his employer is the Velox Motor Company, he is, industrially speaking, employed in the manufacture of motor-cars. But, although he must know what work he does, he may not record the detail of it, and the occupations of persons employed in the motor-car industry cover an immense range. Brown and Jones in the clerical departments of a motor works and an urban district council may occupationally and economically live under identical conditions, but industrially they belong to wholly different classes. The main efforts of medical statisticians during the last generation have been directed to making the classification occupational rather than industrial, but in its main lines it is still industrial. Success is obtained by finer subtabulation.

What troubled Farr most at the beginning was the vagueness of the terminology, and naturally when one passed from the census records of the living to the accounts of the dead in mortuary registers the defect grew worse. The living man had first-hand information; his widow or other survivor had not, and might even be led by pride to falsify the entry. This particular difficulty can never be wholly surmounted.

In the pioneer report Farr confined himself to generalities. He picked out only eleven occupations, and the choice was dictated partly by the heavy mortalities of some (miners, bakers, butchers, and inn and beershop keepers), partly by the relatively definite nature of the occupation (carpenters and joiners, blacksmiths). For several decades the method of 1851 was closely followed. Such changes as were made were in statistical technique.

Comparability of Past and Present: Silicosis

With regard to the question of comparability of past and present I shall point out shortly that, on the whole, there is a stability of order in occupational mortality, that occupations of high mortality relative to the standard eighty years ago are still occupations of high mortality. A good example is that of what we now call industrial silicosis.

This is a condition due ultimately to the inhalation of siliceous particles, which, partly by mechanical irritation, partly in a more subtle way, lead to fibrosis of the lungs and, often through association with the tubercle bacillus, death from consumption. This is a serious risk of metalliferous (not coal) mining, some forms of quarrying, and those branches of the cutlery and toolmaking trades which involve the use of grindstones or carborundum wheels. Both risks were recognized long before Farr's work. The risk to metalliferous miners was known in the sixteenth century, and Thackrah—to go no further back—described grinders' rot more than a century ago.

Now during the last fifty years much has been done to lessen the danger to workmen by protecting them from dust, but *en revanche* it might be that increased refinement of manufacturing processes had intensified the dangers. Well, can we say that, compared with men of their own time, the silicosis workers of to-day are better off than those of seventy years ago? The purely statistical answer—and I must speak as a statistician—is, We do not know. Farr made a group of tool, file, and saw maker, and dealer. He was using the records of 1861 and 1871, and, employing the modern method of statement, their mortality figure is 137. Now this group certainly includes the workers exposed to silicosis risk, but

also others—for example, dealers—not exposed to any special risk. If one takes out of the 1931 return file cutters, filers, cutlery grinders, and cutlers, their mortality figure is 159. But the modern set is restricted to persons exposed to risk: one cannot pick out from the report the dealers in tools; one can pick out some workers who may have been included in Farr's sample—for example, tool setters—with very low mortality rates. In other words, one cannot compare like with like, and I simply do not know whether relatively there has or has not been an improvement. We can, of course, say that *some* occupational risks have been reduced to vanishing-point—such are the lead hazards.

Specific Hazards

I do not mean to speak in detail of the specific hazards of occupation, but wish to direct attention to more general social aspects. Indeed, all I wished to say about specific occupational hazards—I mean by specific occupational hazards those concerned wholly with the occupation itself and not dependent upon its economic, social, or geographical correlates—can be put in a few paragraphs. Those occupations which two generations and more ago were picked out as dangerous occupations—for instance, the forms of mining which lead to exposure to siliceous particles and the branches of the cutlery industry which carry a similar risk, or those occupations which involve the use of lead compounds—continue to be dangerous trades.

Of the ten occupations showing (1930-2) the worst rates of mortality of two hundred listed, no fewer than seven are occupations in which siliceous dust is certainly *the* factor—namely, underground workers in tin and copper mines, sand blasters, underground workers in other metalliferous mines, slate workers and quarriers in Carnarvon and in other districts, kiln and oven men using earthenware, china, and terra cotta, and file cutters. This hazard, whether in metalliferous mines or in the cutlery trade (grinders' rot), was recognized a century and more ago. Of the remaining three out of the worst ten, glass blowers and finishers *may* be subject to silicosis risk; inn and hotel keepers were featured by Farr himself, and there remain only stevedores, whose case, I think, falls under the social-economic rather than the occupational class.

If one simply glances at the tables in the current report on occupational mortality one is impressed by the range of variation. I open the volume on the page which assesses professional occupations. The first entry is clergymen (Anglican), and their Standard Mortality Ratio is 69; the fourth is church, chapel, and cemetery officials, and their S.M.R. is 95. But it would be hard to detect an *occupational* hazard of the officials of churches, chapels, and cemeteries not shared by the clergy. Is there some other reason for the clerical advantage? In the eighth column of the table from which I culled those figures one finds entered against "clergy" the numeral I, and against "church, etc., officials" the numeral III. Clergy are allocated to the highest of the social classes, and the officials to the third of the five formed. One has a particular case of the general rule that the rate of mortality increases as social status decreases. This brings me to the subject upon which I desire to speak at some length, because although it began to be officially investigated two censuses back, what was done at the last census and has been published within the last few months is much more important than all previous work.

Mortality and Social Status

That social status affected mortality is, of course, not a new discovery; it is a subject to which Farr often turned. Chadwick never lost sight of it. But, although Farr more than once contrasted the mortality experience of the peerage with that of the general population, he and Chadwick mostly used what I may call the topographical method—that is, they compared the mortality rates of the east and west ends of towns, or of towns inhabited by well-to-do people with industrial towns. Farr did not make much use of his occupational data for the study of social mortality. Quite rightly. First things come first. In his day occupational hazards were excessive; the first thing to do was to pillory offenders, to raise the hue and cry against industrial poisoners, whether lead or siliceous particles were the instruments of destruction. It is precisely because these occupational hazards have been much reduced that official statisticians give prominence to the social lessons to be learned from an occupational analysis. The late Dr. H. W. C. Stevenson was, I think, the pioneer; he first classified occupations socially, into five broad classes. Let us first consider how these classes are formed. The first point to mark is that, although it is certain that there is, as a statistician would say, correlation between *per caput* income and the class grading and that it would be quite safe to state that the average family income of members of, say, the fifth and lowest class is a good deal less than that of the first and highest social class, the correlation is very far short of unity. The occupations included in the highest social class are these:

Clergy of the Anglican Church, Roman Catholic secular and regular clergy. Ministers of the other non-conforming churches. The legal, medical, and dental professions. Professional engineers, architects, ship designers, surveyors and naval architects, qualified accountants. Articled pupils and professional students, scientists, literary men, secretaries of companies, film producers, company directors, bankers and heads of bank departments, members of the Stock Exchange, heads of departments in insurance companies, commissioned officers in the fighting forces, auctioneers, ship owners and managers, omnibus and tram proprietors, marine and engineering superintendents.

That is the complete list. Now it includes many people who are well paid, but also many people whose average earnings are much smaller than those of persons relegated to the second class. In Class II are to be found the owners and managers of most manufactories and businesses, and—rather oddly—the administrative, executive, and higher clerical staffs of the Civil Service. In fact, it seems that while a second lieutenant in an infantry regiment is a unit in Social Class I, the Permanent Under-Secretary at the War Office belongs to Class II. The medical officer of a large departmental store will certainly be Class I, but unless the insurance branch of the business raises him, the managing director of that multiple shop is certainly Class II. Of course no classification can avoid such anomalies. What is clear is that, statistically speaking, on the whole, Class I contains the person whose social position, using that phrase in its common significance, with if you please the slightly snobbish connotation of our English ways of thought, is above that of Class II. As G. B. S. once said, a moderately prosperous publican (Class II) would turn up his nose at the earnings of a professor of mathematics (Class I), but there are more mathematicians than publicans in the Athenaeum. So we may say that this classification is really a social order; mere wealth may put one high, but mere education may do so too.

Wives of Occupied Men

This method of presentation has been used in three censuses; a new feature is the tabulation of the mortality rates of the wives of occupied men. The value of this is great; wives share the social and geographical advantages of their husbands' occupation but, with relatively unim-

portant exceptions, are not exposed to their specific occupational risks. The wealth of new information is so great that I must select.

In the ten years the range of mortality has been reduced. In 1921–3 the highest social class enjoyed a rate 18 per cent. less than that of all males, and the lowest class suffered an excess of 21 per cent.; in 1930–2 the highest class were 13 per cent. better and the lowest 12 per cent. worse than the average. Wives of the highest class were 19 per cent. better and of the lowest 13 per cent. worse than the average. The explanation of this is interesting. There are some diseases, a majority of the most killing diseases, which take relatively more victims from the lower social grades, and here the advantage of the husbands is shared by the wives. Then there are some diseases in which the upper classes, both husbands and wives, suffer more than the lower classes, but the disadvantage of the upper-class husbands is appreciably greater than that of the upper-class wives. Finally there are some diseases which afflict upper-class husbands more than the average but upper-class wives less than the average. Now all of these are diseases which in lay belief, and not quite without medical warrant, are associated with living too well. So we may explain the advantage of women of the upper social classes. They share with their husbands the advantages of better education and a larger income, but separate themselves from its disadvantages. I may leave you to point a moral to adorn this statistical tale. There are but few official banquets at which the presidents of—well, certain professional organizations belonging to the Registrar-General's Class I are not present. Their wives are not invited or, at best, sit in the ladies' gallery. Thus is made a tiny contribution to a statistical result.

Housing: The Density Factor

I now turn to a result which would, I think, have appealed to Edwin Chadwick, and so one which in a Chadwick Lecture may fitly be given prominence. You will recollect how great was the emphasis Chadwick put upon housing: his fury at the conditions of early Victorian towns. I do not think our generation can be reproached with neglect of housing, but the slogan of nutrition is chanted more vehemently just now than that of housing. The Registrar-General has carried out the comparison of social class mortalities in different regions of England and Wales. In one table the worst and best topographical areas of our country are examined. Note this: the best and worst mortalities of the highest social class differ by 8 points, the worst is 13 per cent. better than the average for men; for wives the range is greater—15 points—but the worst 10 per cent. below standard. In the two worst classes the range is actually 50 per cent. for men and 47 per cent. for wives. But in the rural districts of the North the mortality of both men and wives in the lowest classes is virtually the same as the standard.

I cannot help feeling that our great-grandchildren may derive from a contemplation of that table something of that sensation which some of you had when I read at the beginning of this lecture those extracts from evidence which Chadwick heard a century ago. Why this frightful contrast? So far as the Registrar-General has succeeded in his classification, the Classes IV and V people in the rural districts of the North are educationally and economically just as poorly off or just as well off as their comrades in the county boroughs. Nobody who has motored through the villages of Durham will mistake the dwellings for stockbrokers' week-end cottages. They are, in fact, often mere hovels. Why, then, a difference of 36 per cent. in mortality?

I think Chadwick and Farr would have stressed what Farr called the density factor. As we are wholly concerned with mortality rates on adults, the obvious factor of common infectious diseases of childhood—measles, etc.—does not come into play. But there remain tuberculosis, pneumonia, venereal disease, perhaps influenza.

The Psychological Factor

I think there remains something else—a psychological factor. I dare say I am growing obsolete. There is a very Victorian passage in one of Simon's reports which I always inflict upon my students. It is almost a century old.

> "In my former report, I drew your attention to this pestilential heaping of human beings, and suggested to you its results; and on many occasions, during the past year, complaints have been before your Hon. Court which have had their real origin in this uncontrolled evil. I revert to it because of its infinite importance. While it maintains physical filth that is indescribable, while it perpetuates fever and the allied disorders, while it creates mortality enough to mask the results of all your sanitary progress, its moral consequences are too dreadful to be detailed. I have to deal with the matter only as it relates to bodily health. Whatever is morally hideous and savage in the scene—whatever contrast it offers to the superficial magnificence of the metropolis—whatever profligacy it implies and continues—whatever recklessness and obscene brutality arises from it—whatever deep injury it inflicts on the community—whatever debasement or abolition of God's image in men's hearts is tokened by it—these matters belong not to my office, nor would it become me to dwell on them. Only because of the physical sufferings am I entitled to speak; only because pestilence is for ever within the circle; only because Death so largely comforts these poor orphans of civilization. To my duty it alone belongs, in such respects, to tell you where disease ravages the people under your charge, and wherefore; but while I lift the curtain to show you this—a curtain which propriety might gladly leave unraised, you cannot but see that side by side with pestilence there stalks a deadlier presence; blighting the moral existence of a rising population; rendering their hearts hopeless, their acts ruffianly and incestuous; and scattering, while society averts her eyes, the retributive seeds of increase for crime, turbulence, and pauperism."

The latest analysis of occupational and social mortality contains much of which we may be proud, but it would be wrong to conceal some of the dark shades in the picture. This is the darkest shade.

You will find in the report from which I have mainly quoted not only most instructive analyses of the special mortalities within great occupations but also very striking statistical evidence that in one great industry, coal-mining, a lack of improvement in rates of mortality at younger ages since 1921 is probably due to movement out of the industry of the stronger and more enterprising men. But that gives me a cue for some final observations.

Morbidity and "Atmosphere"

Farr, Ogle, Tatham, Stevenson, and now Dr. Stocks report on occupational mortality. In the words of the old proverb, stone dead has no fellow. It is still true and likely to be true that rates of mortality are our best guides. But usually one is ill before one dies, and logically the study of morbidity should precede that of mortality. But we have still no adequate data of morbidity. The Industrial Health Research Board's staff, particularly my friend and colleague Dr. May Smith, have been steadily at work, assembling morbidity statistics and correlating them with some occupational factors. These researches have demonstrated the importance of what I may call the psychological atmosphere of a factory or

work-place in increasing or depressing the rate of morbidity. It by no means follows that morbidity and mortality rates rise and fall together. It may and does happen that an establishment with a low mortality rate has a very high sickness-absence rate. But a high sickness rate often means psychologically unsatisfactory conditions. Morbidity, if it could be fairly measured, might well be a more valuable industrial pointer than mortality. Here is a task for the future.

At least I hope to have convinced you that even in mortality data alone there is material which not only the professional statistician but the social worker, the administrator, and indeed every educated citizen, should study and understand. All this light on contemporary social conditions should not be imprisoned between the covers of a Blue-book, but should illumine our understandings and our hearts, teaching us to work for a better England, like Chadwick long ago.

THE NATURE OF CHRONIC MASTITIS

BY

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The resistance of the body to infectious disease involves the operation of three distinct mechanisms. The first of these depends on an inherited quality of cell structure or metabolism, and is called a natural immunity. The second is a serological reaction leading to the production of antibodies, and is termed acquired immunity. The third is a local tissue reaction whereby leucocytes and fibroblasts, summoned to the site of invasion, erect a barrier of granulation tissue against the further inroads of the disease. This local reaction accounts for a series of clinical conditions known collectively as the chronic granulomata.

If we attempt to relate neoplastic to infectious disease, we find certain broad features of resemblance. Infections are caused by the introduction into the body of pathogenic organisms, neoplasms by the operation of some extrinsic factor. Individuals, families, and even races exhibit a natural immunity to certain infectious diseases, and there appears similarly to be a natural immunity to neoplastic disease in certain strains or species of animals, depending equally on inherent qualities of cell structure or metabolism. A type of acquired immunity in the serological sense is met with in relation to implanted tumours, but has not been demonstrated with spontaneous tumours or in relation to the extrinsic factor itself. It is, however, probable that some immunizing mechanism, closely allied to that obtaining in bacterial invasion, is provoked by neoplastic disease. It is thought that such a mechanism may be responsible for the rarity of the occurrence of two primary growths in one individual. It remains to inquire whether there is any process involved in neoplastic disease comparable to the formation of granulation tissue in infectious disorders, and, even more remotely, whether there is a series of clinical conditions analogous to the chronic granulomata.

Is Chronic Mastitis a Precancerous Condition?

Evidence relating to this problem is obtained from a study of the natural history of the disorder known as chronic mastitis. There has long been an apparently irreconcilable difference of opinion between the histologist and the clinician as to the precancerous nature of this disease, a difference of opinion based on evidence so conflicting as to demand the closest analysis. For many years the histologist has maintained that the epithelial proliferation of the mammary ducts to which, with cyst formation, he has given the name of "chronic mastitis" leads to cancer (Cheatle and Cutler, 1931). He says this because he can take a series of microscopical sections from different breasts and, arranging them in order, display an unbroken sequence of epithelial change from the normal at one end of the scale, through the epithelial patterns characterized by him as chronic mastitis, to carcinoma at the other. This evidence is suggestive but not conclusive. By reversing the sequence it could equally well be maintained that the normal breast develops from carcinoma, a postulate which we know from outside evidence to be absurd. The assumption, however, that the order chosen arbitrarily by the histologist represents a natural sequence receives strong confirmation from a collateral source.

The experimental pathologist has succeeded in producing cancer of the breast in animals by the injection of oestrin; and Lacassagne (1932, 1933, 1934, 1936) has shown that the preliminary changes in the breast epithelium which eventually lead to cancer are precisely similar to those designated by the histologist as chronic mastitis. On this evidence it must be concluded that the epithelial changes observed under the microscope in sections taken from the breasts of cases of chronic mastitis may be precancerous. On the other hand, an overwhelming number of clinicians of experience believe that the disease which they term chronic mastitis has no especial liability to become cancer. This belief is founded on impressions derived from long association with many cases of chronic mastitis. Impressions are apt to be fallacious, and the only scientific evidence on this aspect of the problem comes from Bloodgood (1932), who followed up a series of cases for many years and concluded that the incidence of breast cancer in patients suffering from chronic mastitis was no greater than in the general population. In the mastitis clinic at Guy's Hospital, where 170 cases of mastitis, many of them of long standing, are being investigated and followed up, no case has developed carcinoma within the two and a half years' life of the clinic.

In a previous paper (Atkins, 1938) I have pointed out that the only way to ascertain whether a disease A predisposes to a disease B is to take a sufficient number of cases of A, follow them up for some years, and observe whether disease B occurs in a greater proportion of these than in the general population. This investigation has been undertaken in relation to chronic mastitis and cancer, and has not revealed a predisposition of the one for the other. Although statistical evidence to be conclusive must be based on a larger number of cases than have yet been investigated, it is certain that carcinoma of the breast follows chronic mastitis in a strikingly small proportion of cases, having regard to the precancerous nature of the epithelial changes which accompany the disease.

Significance of the Fibrous-tissue Proliferation

These precancerous tendencies must therefore be arrested, and it is in this connexion, I think, that the histologist has concentrated too exclusively on the epithelial changes of chronic mastitis, and not given sufficient weight to the significance of the fibrous-tissue proliferation. In the biopsy material from the mastitis clinic a fibroblastic reaction has been an outstanding feature of the microscopical picture. In comparing a series of slides from this clinic with a series taken from the breasts of women who had died from diseases unconnected with the breast, I found that it was as easy to distinguish the mastitis clinic

sections from the post-mortem room sections by observing the fibrous tissue as by concentrating on the epithelial pattern. The epithelial changes designated chronic mastitis by the histologist and assumed to be precancerous were present in a small proportion of the control sections, but it was quite exceptional to find an excess of highly nucleated fibrous tissue in sections taken from patients not complaining of the symptoms of chronic mastitis. The clinician when he refers to chronic mastitis means a painful nodular breast, and an outstanding feature of the painful nodular breast is fibrosis with or without cysts. If now this fibrosis accompanies epithelial changes, which threaten cancer but rarely fulfil their threat, it is possible that the fibrous tissue may be produced in response to that threat and may play a part in preventing it from coming to fruition. Consequently it would be just those patients who are able to develop a fibrous-tissue reaction to epithelial overgrowth—that is, those who complain of the symptoms of chronic mastitis—who would be unlikely to develop cancer. The conception that the fibrosis of chronic mastitis is an expression of a local defence mechanism resolves the problem of the precancerous nature of this disease in conformity with both the histological and the clinical evidence. Moreover, it falls into line with the established procedure of Nature in dealing with infectious disease and provides the counterpart to the granulation tissue which is such a prominent feature of that process.

That the problem of the protective function of fibrous tissue is an exceedingly complicated one is appreciated from a consideration of the relative malignancy of the different types of carcinoma of the breast. The malignancy of a breast cancer cannot be assessed from the amount of fibrous tissue present, as would be the case if fibrosis were the only mechanism of defence against the malignant cell. Where so many factors operate, these may exert a predominating influence on the clinical picture. In the absence, for instance, of a certain degree of natural or acquired immunity no amount of fibrosis could of itself control the spread of the disease. One factor among many might only be expected to colour the whole picture when it was operating in its most intense form. Such an intensity of fibrosis is met with in the atrophic scirrhus: here the combination of fibrosis with the most anaplastic type of epithelial cell leads to a control of epithelial growth which may delay the spread of the disease for many years. Thus in those cancers where the morphology of the epithelial cell would lead us to expect a rapid growth but which lie dormant for years, and in chronic mastitis where precancerous changes suggest a malignant tendency which is not fulfilled, the only accompanying phenomenon observable is fibrosis. On that account the theory of the protective function of fibrous tissue against epithelial new growth is put forward as a working hypothesis. This appeal to the old tissue-tension theory of Waldeyer and Thiersch does not suffer from the objections to that theory in its original form. It is not suggested that an upset of the equilibrium between fibrous and epithelial tissue is the whole story of the development of cancer, but it is proposed that fibrosis is engendered by a tendency to epithelial overgrowth and that the fibrosis is one part of the complicated mechanism of defence against neoplastic disease comparable to granulation tissue in infectious disease.

Pathology of the "Fibromatoses"

Lastly, if this be so, it is pertinent to inquire whether there is a series of clinical conditions comparable to the chronic granulomata and expressive of a local tissue reaction to the threat of malignant invasion elsewhere in the body. We have discussed the relation of chronic mastitis to this problem, but there is a class of clinical phenomena, which I will call the fibromatoses, which might repay investigation in this connexion. I refer to leucoplakia, Riedel's thyroiditis, fibrotic prostate, linitis plastica, and fibromatosis of the colon. An entirely satisfactory pathology has not as yet been assigned to these conditions, and in order to stimulate further investigation the suggestion is put forward that the fibromatoses, including chronic mastitis, may be the homologues in neoplastic disease of the infective granulomata.

Summary

The natural history of chronic mastitis is considered, and an analysis made of the evidence as to whether the condition is precancerous.

It is submitted that the fibrosis occurring in chronic mastitis is part of the mechanism of defence against neoplastic disease, comparable to granulation tissue in infectious disease.

The suggestion is made that the "fibromatoses" might repay investigation in connexion with the appearance of cancer in other parts of the body.

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BLOOD LAEVULOSE IN THE LAEVULOSE TOLERANCE TEST

WITH SPECIAL REFERENCE TO NORMAL STANDARDS

BY

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When laevulose reaches the normal liver by the portal veins it is rapidly utilized, part being oxidized and part stored as glycogen. The rate of utilization is almost as rapid as the rate of absorption from the intestine, so that very little laevulose reaches the general circulation after oral administration of the sugar. If the glycogenic function of the liver is impaired by disease the rate of utilization fails to keep pace with the rate of absorption, and an abnormally large amount of laevulose passes through the liver into the systemic blood stream. These facts provide the basis for the laevulose-tolerance test of hepatic function. In the past the method of performing the test has been to follow the changes in total blood sugar after a dose of laevulose, and it has been assumed that any increase above the fasting level is due to laevulose.

Recent Investigations

In recent years methods have been developed for the analysis of blood laevulose, and various authors have made fresh investigations of the laevulose-tolerance test in which the blood laevulose has been directly estimated

(Scott, 1935; Stewart, Scarborough, and Davidson, 1937, 1938; Steinitz, 1937; Herbert and Davison, 1938). All these workers agree in their main conclusions, which are as follows. The blood glucose may either rise or fall during the test, so that the rise in total blood sugar does not give a measure of blood laevulose, and results based on total blood sugar may be misleading. The normal range of variation is narrower for blood laevulose than for total blood sugar. In a wide variety of non-hepatic diseases the blood-laevulose curves are normal. In arteriosclerosis Stewart *et al.* found deficient laevulose tolerance, but so far this is the only exception to the rule that the results are normal in the absence of liver disease. In uncomplicated diabetes the total blood sugar may show a considerable rise after the dose of laevulose, but the blood-laevulose curve is normal. Abnormally high rises in blood laevulose occur in a considerable proportion of cases of liver disease, though not in all. Evidently the liver has a large functional reserve, and the test does not reveal deficiency unless there is severe damage to the liver.

Necessity for a Normal Standard

These results show that the laevulose-tolerance test is sound in principle, and becomes more reliable in practice if it is based on analyses of blood laevulose instead of total blood sugar. There is, however, some discrepancy among different authors as to the standards which should be accepted as normal. This does not invalidate the main conclusions derived from their work, since in each study the findings in liver disease have been interpreted in relation to normal standards worked out by the same technique. But if blood-laevulose estimations are to be generally adopted for clinical use the normal range ought to be clearly defined. This is especially necessary, because in many cases of liver disease the peak of the blood-laevulose curve is only slightly above the upper limit of normal.

It is generally agreed that there is no measurable amount of laevulose in the blood in the fasting state. After the dose of laevulose (50 to 60 grammes) that substance appears in the blood, reaching a peak in one-half to one hour, and then falling. Scott examined six normal subjects and five cases of non-hepatic disease. He used his own method for the estimation of laevulose, which depends on a reaction between laevulose and bile salts. He found no laevulose in "fasting" blood and a maximum level never greater than 12 mg. per 100 c.cm. in venous blood. The other workers quoted used the diphenylamine method in various forms. It consists in the measurement of the blue colour produced when laevulose is heated with diphenylamine in acid solution. By this method one obtains a slight trace of colour in analysing "fasting" blood, but it is much too faint for accurate measurement. It seems probable that the differences in the figures obtained by different workers are due to the difficulty in allowing for this apparent fasting level. The colour is mainly due to the blood glucose, which reacts to a very slight extent with the diphenylamine. Steinitz, on the basis of over 200 tests in subjects without hepatic disease, stated that laevulose was absent from "fasting" blood and that the maximum level was never greater than 12 mg. per 100 c.cm. in venous blood, or 15 mg. per 100 c.cm. in cutaneous capillary blood. Stewart, Scarborough, and Davidson estimated the rise in blood laevulose above the apparent level in "fasting" blood, and found that normally this rise might amount to 20 mg. per 100 c.cm. in venous blood. Their figures all tended to be higher than those of other workers, since their average peak in normal subjects was 12.8 mg. per 100 c.cm. They recognized that in their analyses the apparent fasting level was not precisely measured in each individual instance. Herbert and Davison found that the maximum normal rise above the apparent initial level was 15 mg. per 100 c.cm. (venous blood), and that only a small minority of cases showed peaks above 10 mg. per 100 c.cm.; but they made no analyses earlier than one hour after the test dose, and there was a possibility that some higher levels might have been found if the half-hour point had been included.

Herbert and Davison used Patterson's method for the estimation of blood laevulose. When their work was almost completed I evolved a new modification of the diphenylamine method (Herbert, 1938). This method is much more quickly carried out than the older procedures, and is therefore better suited to the needs of hospital laboratories.* It also gives much more intense colours, which can be measured with greater accuracy—a factor that is especially useful in dealing with "fasting" blood. The older methods gave a faint greenish-blue tinge, due to a mixture of a trace of blue, which is accounted for by the effect of glucose, and a trace of yellow from some unknown source. In the new method the yellow element becomes negligible in relation to the blue, and the glucose effect can be more precisely measured and allowed for.

The purpose of the present paper is to give the results obtained by this technique in subjects with healthy livers. For convenience the whole procedure will first be described.

Methods for Estimating Blood Laevulose

The dose of laevulose is 50 grammes for an adult, and for a child 1 gramme per kilogramme of body weight. It is given after a night's fast. Samples of venous blood, about 5 c.cm., are taken before the dose of laevulose, and at half an hour, one hour, and two hours after. Potassium oxalate is used as an anticoagulant; an excess of oxalate should be avoided.

ANALYSIS

Reagents:

(1) 10 per cent. $ZnSO_4.7H_2O$.

(2) 0.5*N*. NaOH.

(3) Stock diphenylamine solution. 20 per cent. diphenylamine in alcohol.

(4) Acid-alcohol-diphenylamine reagent: ethyl alcohol, 70 parts; concentrated HCl, 50 parts; stock diphenylamine solution, 6 parts. This reagent should not be more than a month old when used.

(5) Stock laevulose solution, 1 per cent. in saturated benzoic acid. The laevulose should be desiccated before weighing.

(6) Standard laevulose solutions (freshly prepared): (*a*) 1 c.cm. stock solution diluted to 200 c.cm. with water (2 c.cm. = 0.1 mg. laevulose). (*b*) 25 c.cm. of standard (*a*) diluted to 100 c.cm. (2 c.cm. = 0.025 mg. laevulose).

PROCEDURE

Take 2 c.cm. plasma in a 15 c.cm. centrifuge tube. Add 2 c.cm. water and 2 c.cm. 10 per cent. zinc sulphate solution. Close the tube with a rubber stopper and shake thoroughly. Add 2 c.cm. 0.5*N* NaOH and again shake thoroughly. Centrifuge the mixture well and pour the supernatant fluid through a small filter (Whatman No. 42 paper, 5.5 cm.). The yield of filtrate is just over 4 c.cm., which allows of duplicate

* It should be mentioned that another rapid method, based on a different principle, has recently been described by Jordan and Pryde (1938). So far there has been no report of the use of this technique in the laevulose-tolerance test.

analyses. In a pyrex test-tube (about $\frac{5}{8} \times 6$ in.), graduated at 10 c.cm., take 2 c.cm. filtrate and 6 c.cm. acid-alcohol-diphenylamine reagent. The standard laevulose solutions (2 c.cm. of each standard) are similarly treated. Place the tubes in a boiling-water bath for exactly fifteen minutes and then cool them rapidly in running water. Dilute with alcohol to the 10 c.cm. mark, and compare the colours in the colorimeter, using standard (*b*) for comparison with the filtrates from "fasting" plasma and standard (*a*) for the remainder.

CALCULATION

Let R_s = reading of standard
Let R_u = reading of unknown

The plasma laevulose, mg. per 100 c.cm., is given by the formulae:

$$\frac{R_s}{R_u} \times 20 \text{ when standard } (a) \text{ is used;}$$

$$\frac{R_s}{R_u} \times 5 \text{ when standard } (b) \text{ is used.}$$

If absolute figures for blood laevulose are required, the total blood sugar is estimated and a correction made for the effect of the blood glucose. The effect of 100 mg. glucose per 100 c.cm. is equal to that of 2.4 mg. laevulose per 100 c.cm.

In performing the laevulose-tolerance test in non-diabetic subjects it is justifiable to treat the glucose effect as constant throughout the test and to estimate the blood laevulose after the test dose from the rise above the apparent initial level. For diabetic subjects it is desirable to estimate the total sugar and make the correction, but even in diabetes the effect of the correction on the interpretation of the results is very small. The figures for plasma are identical with those for whole blood.

Results

The results obtained in twenty-six subjects without hepatic disease are given in Table I. The figures have not been corrected for the effect of glucose, except in the one case of diabetes. The apparent fasting level ranges from 1.5 to 3.5 mg. per 100 c.cm. Figures of this order are to be expected as due to the blood glucose. Very little, if any, laevulose is present in the fasting state. The maximum level may occur either at half an hour or at one hour after the test dose. The highest peak occurred in the case of diabetes, in which the rise above the initial level was 15 mg. per 100 c.cm. Of the remaining twenty-five subjects only three showed rises greater than 11 mg. per 100 c.cm. above the apparent initial level. If one takes a rise of 15 mg. per 100 c.cm. as the upper limit of normal, an adequate margin is allowed for the normal variation, since very few results fall in the upper part of the range. These figures are in general agreement with those of Scott and of Steinitz, and are definitely lower than those of Stewart, Scarborough, and Davidson. The standard now adopted is exactly the same as that used by Herbert and Davison. Although in individual cases the level half an hour after the test dose is often higher than at one hour, the inclusion of the half-hour point has not necessitated any extension of the normal range.

The level at two hours after the test dose is, in the present series, never greater than 6.2 mg. per 100 c.cm. above the apparent fasting level, but since in the earlier work the corresponding figures occasionally reached 10 mg. per 100 c.cm. it is safer to use the higher figure in considering whether or not the rise in any case of disease is unduly prolonged.

TABLE I.—*Blood-laevulose Curves in Subjects without Hepatic Disease*

Diagnosis	Apparent Plasma Laevulose mg. per 100 c.cm.				Rise above Apparent Initial Level mg. per 100 c.cm.		
	Before Laevulose	½ hr. after	1 hr. after	2 hrs. after	½ hr. after	1 hr. after	2 hrs. after
Normal	3.5	11.0	9.0	4.7	7.5	5.5	1.2
,,	3.5	9.2	10.0	6.0	5.7	6.5	2.5
,,	2.8	9.5	7.6	7.8	6.7	4.8	5.0
,,	3.1	5.0	6.6	5.5	1.9	3.5	2.4
,,	3.3	10.2	7.0	4.2	6.9	3.7	0.9
,,	2.4	15.5	11.5	4.5	13.1	9.1	2.1
,,	1.7	11.0	10.5	4.5	9.3	8.8	2.8
,,	2.4	10.5	7.0	4.2	8.1	4.6	1.8
,,	2.0	15.5	10.0	4.7	13.5	8.0	2.7
,,	2.0	13.0	8.0	3.3	11.0	6.0	1.3
,,	2.7	8.6	10.9	6.0	5.9	8.2	3.3
,,	2.2	12.5	13.0	5.0	10.3	10.8	2.8
,,	1.7	9.0	9.5	3.7	7.3	7.8	2.0
,,	2.2	11.0	9.0	4.0	8.8	6.8	1.8
,,	2.0	12.0	7.3	4.0	10.0	5.3	2.0
,,	2.0	5.4	7.0	6.0	3.4	5.0	4.0
,,	3.0	8.2	9.5	7.0	5.2	6.5	4.0
,,	1.7	9.5	10.0	7.0	7.8	8.3	5.3
Skin pigmentation	1.5	14.0	12.0	4.0	12.5	10.5	2.5
Malignant ovarian cyst	2.0	10.0	11.0	4.5	8.0	9.0	2.5
Diabetes	2.0	14.0	17.0	4.0	12.0	15.0	2.0
Carcinoma of oesophagus	1.7	7.0	7.5	6.0	5.3	5.8	4.3
Hypertrophic gastritis	2.0	10.5	7.7	6.0	8.5	5.7	4.0
Subacute bacterial endocarditis	1.5	8.5	7.0	4.2	7.0	5.5	2.7
Splenic anaemia (four years after splenectomy)	3.0	10.0	10.0	7.5	7.0	7.0	4.5
Nutritional macrocytic anaemia	2.9	6.6	10.0	9.1	3.7	7.1	6.2

TABLE II

Diagnosis	Total Number of Cases	Number of Cases in which the Rise in Blood Laevulose per 100 c.cm. was:			
		Up to 10 mg.	11–15 mg.	16–20 mg.	Over 20 mg.
Normals and non-hepatic diseases	26	20	6	0	0
Hepatitis	2	0	0	1	1
Cirrhosis of liver	7	1	2	1	3
Malignant disease of liver	8	1*	2	5	0
Total liver diseases	17	2	4	7	4
Biliary obstruction	3	1	2	0	0

* This was a case of abdominal sarcoma, with only a few secondary nodules in the liver and no gross destruction of liver tissue.

A number of results in diseases of the liver have been obtained since the new analytical method was introduced, but as they merely provide additional illustrations of the facts established by earlier work they will not be described in detail. The cases in which the diagnosis could be definitely established are summarized in Table II. The majority of cases of hepatic disease show definitely high laevulose curves, though frequently the results are only slightly above the upper limit of normal. In some cases there is an early high peak followed by a rapid fall; in

others the blood-laevulose curve is not only raised but is also prolonged.

One case of carcinoma is of special interest as giving some indication of the extent of liver damage which must occur before the laevulose tolerance begins to show deficiency. The blood-laevulose curve, estimated five days before death, showed that the rise above the apparent initial level was, at half an hour after the dose of laevulose, 14 mg.; at one hour, 16 mg.; and at two hours, 10 mg. per 100 c.cm. This was a border-line result—only just outside the normal range. At necropsy the liver was found to be extensively disorganized by carcinoma, infarction, and necrosis, and it was estimated that about half the liver tissue had been destroyed. Now in such a case the condition resembles the result of partial hepatectomy. Little, if any, blood will pass from the portal veins to the hepatic veins through grossly damaged tissue. Almost all the blood which passes through the liver will traverse tissue of good functional capacity. It seems that in such circumstances a deficient laevulose tolerance indicates that at least half the liver tissue is out of action. In diffuse lesions, such as acute hepatitis, the condition is quite different, since all the circulatory paths through the liver will traverse damaged tissue, and this probably accounts for the fact that in acute hepatitis the laevulose tolerance is usually definitely deficient during the attack.

The diagnostic value of the test is limited by the existence of a large functional reserve in the liver. A normal result does not exclude liver disease. But, like renal function tests, the laevulose-tolerance test may give information as to the extent of the damage when a lesion has been recognized on clinical evidence. In some cases the test has diagnostic value; I have met with instances in which deficient laevulose tolerance has been demonstrated when the existence of liver disease could be neither proved nor excluded on the clinical evidence. The test may sometimes assist diagnosis—for example, in cases of unexplained haematemesis, unexplained anaemia, and in detecting hepatic cirrhosis in Banti's disease at a stage when the clinical evidence is inconclusive.

Summary

As a result of earlier work it has been shown that the laevulose-tolerance test becomes more reliable if the results are based on estimations of blood laevulose rather than total blood sugar.

My modification of the diphenylamine method for the estimation of blood laevulose has resulted in greater speed and accuracy of analysis.

Normal results for blood-laevulose curves obtained by this method are presented.

Some additional results in cases of liver disease are described.

I am indebted to the honorary medical and surgical staff of the Royal Victoria Infirmary for the opportunity to examine cases and for the use of clinical notes; to my colleagues on the pathological staff for histological and post-mortem data; and to the volunteers who offered themselves as subjects for the study of normal results.

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ASTHMA AS A SEQUEL OF NASAL INJURY

BY

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The association of asthma with disease of or pressure on areas of the nasal mucosa has been recognized for many years, and has often been made the basis of anti-asthmatic treatment. The importance of nasal pathology is, however, now much debated, and an authority has stated that "physicians nowadays are beginning to realize that it is only a minor cause in some cases and a major secondary effect in a majority of adults" (Bray, 1931). The importance of trauma in this respect has not been stressed, and as it may at times appear to play a part—not merely minor or secondary, but actually a sole part—in the production of asthma, the following two cases may be of interest.

Case I

The patient, a messenger girl aged 17, had been exceptionally healthy, without chest trouble of any kind, urticaria, migraine, or other allergic manifestations. The family history was similarly free. On June 27, 1932, she was flung from her bicycle, and her head struck the ground violently. She was admitted to Exmouth Hospital, where on examination she was found unconscious, with stertorous respiration, pupils dilated and non-reactant, and limbs flaccid, with occasional spasms. There was a triradiate wound, the largest limb of which extended upwards and to the left from the nasion for a distance of three inches, exposing the frontal bone. There was extensive bruising of the face, with haematomata of both orbits. There were also abrasions of hands, knees, and shins. The head wound was cleaned and dressed without suture. For five days the patient's condition appeared grave. Symptoms of cerebral concussion and irritation then disappeared rapidly, the wound closed, and in three weeks she was discharged at her own request. As the facial swelling subsided it was seen that there had been a fracture of the bones of the nose, with lateral displacement of moderate degree. This was not treated. She continued to attend as an out-patient, and appeared to have made a good recovery. There were no symptoms of chest trouble.

On August 7, 1932, she suddenly developed spasmodic dyspnoea of expiratory type, asthmatic in character, very severe, and relieved by adrenaline. Attacks of this kind continued in spite of treatment on usual medical lines, with local nebulae. Protein-sensitivity tests gave no result. In November she was referred to a hospital nose and throat department, where it was reported that there was deflection of the septum and scarring, definitely due to the accident, but that in view of the patient's chest condition operation was not advised. The asthmatic condition continued for a further period of sixteen months, with some improvement in the summer of 1933, but with prolonged attacks of great severity. The patient became kyphotic, dyspnoeic, and cyanosed, instead of stalwart and upstanding, with the clear colour that is often seen in the red-haired. She was quite unable to work, in spite of courses of vaccine and peptone treatment and breathing exercises.

In March, 1934, operation for resection of the septum was performed. The immediate effect of this was to some extent disappointing. Nasal obstruction was relieved, but the asthma continued, slowly diminishing in severity until May, 1935, since when the patient has had no attacks. Treatment of any kind ceased in February, 1935.

Case II

A retired lieutenant-commander, aged 40 and unmarried, had a history free from any chest trouble or allergic manifestation. The family history was similarly free. On August

18, 1935, when in perfect health, he was involved in a motor accident, sustaining cerebral concussion, fractured right fibula, lacerated wounds of the forehead and left orbital regions, and bruising of the facial tissues, hands, and left knee. He was admitted to Hove Hospital, where he was unconscious for twenty-four hours. Three attempts to control the fragments of the fibula were made, and finally a bone peg was inserted and he was discharged with the leg in plaster.

On October 4, 1935, he developed acute nocturnal dyspnoea, expiratory in type, of great severity. On examination the lungs were full of expiratory sounds. There was a forked scar over the side of the bridge of the nose, the two limbs running up the forehead and over the right eyebrow. The nose internally showed obstruction of the left naris. Adrenaline relieved the attack, but though further treatment with a nasal spray of ephedrine and chloretone, and the usual drugs internally, kept the more violent paroxysms under control, the patient was in constant discomfort. With the former case in mind, he was referred to Mr. Harold Downer, who reported: "The nasal septum is markedly deflected to the left, and there is opacity of the left antrum."

Submucous resection was performed on November 25, 1935, by Mr. Downer. By November 27 the asthma was much improved, and since January, 1936, has not recurred.

Comments

It is submitted that nasal injury resulting in deformity was the precipitating factor in the development of asthma in these patients, who had never previously shown any asthmatic tendency, and have shown none in the considerable time which has elapsed since full recovery from operation. On the other hand, the great majority of cases of nasal injury have no sequel of this kind. A number of reasons may be suggested for the appearance of asthma in these two individuals. Doubtless unknown predisposing factors were present, as emphasized by Maxwell (1936). In addition, however, the above accidents produced severe trauma. The violence with which the girl struck the ground, and the man the wind-screen, was probably more than is involved in most nasal accidents. There was also an element of psychical trauma. Shock at the time, the possibility of police intervention, litigation in the civil courts, and anxiety regarding means of livelihood were added. Further—and it is suggested that this is most important—it happened that other and more urgent injuries than those to the nose were present, and owing to the pressure of the treatment of these the condition of the nose and the nasal passages could not be determined in the early stages and was not investigated before discharge from hospital. For these reasons deflection of the septum and scarring of the wound in the mucosa probably combined to produce a trigger area which, in patients whose nervous balance was disturbed, resulted in the sudden onset of acute asthmatic attacks. These appeared after intervals of six to eight weeks.

In fractures of the nose unaccompanied by other injury treatment is much more early given, and even if external reposition is not perfect, the nares are likely to be left patent and conditions for asthma production are prevented. When the injuries in these two cases had produced asthma, the presence of asthma was no contraindication to operative treatment. Delay in operation was followed by a poor immediate result and a lengthy interval before the disappearance of the attacks. Immediate operation was followed by rapid relief and disappearance.

The operation was that of simple resection, and it should be emphasized that no suggestion is made that nasal treatment for asthma of other origin should take this form. Nor is it regarded as clear why such operation should relieve mechanical pressure, since the asthmagenic area of Dixon and Brodie does not appear to coincide with that concerned in submucous resection. However, though it is realized that two cases are quite insufficient for far-reaching conclusions, the following of some practical importance seem justifiable.

Conclusions

Nasal injury may be a precipitating factor in the production of asthma.

In cases of nasal injury accompanied by more severe injury elsewhere, the condition of the nose should be borne in mind, ascertained before discharge, preferably by specialist opinion, and remedied if in any way doubtful.

Once asthma is established, operation to remedy nasal deformity is indicated at the earliest possible moment.

The presence of asthma is no contraindication to operative treatment, and the results may be expected to be good in proportion to the promptitude of operation, provided that the history and the condition of the patient show no other cause for the development of the asthma.

I am much indebted to Mr. Harold Downer for his criticism and advice.

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MANAGEMENT OF A HAY-FEVER IONIZATION CLINIC

A COMPARATIVE STATISTICAL SURVEY OF RESULTS IN 1937 AND 1938

BY

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The Margaret Street Hay Fever Ionization Clinic, attached to the Margaret Street Hospital for Diseases of the Chest, was opened in the spring of 1937, and the results of the treatment for 1937 were reported in the *Journal* of April 30, 1938 (p. 948). The figures for 1938 show a great improvement over those of 1937. This improvement may either be due to the general mildness of hay fever during the season of 1938 or be the effect of our modified technique. In the first place, in 1938 we to a large extent gave up prophylactic ionization, and most of the patients were treated either immediately before the expected onset of the hay fever or actually at the beginning of the attack. Secondly, last year we were using an ionization current of 6 to 8 milliamperes, whereas in 1937 the current was only 3 to 5 milliamperes. Subsequent experience will show whether the improved results of 1938 are really due to the modified technique.

Organization

The organization of the clinic has been further simplified, and can be briefly described as follows. The appointment book is arranged in such a way as to show at a glance the ionization sets (of which there are eighteen) still available at any particular time. The patient is received by an attendant, who takes his particulars and at the same time sprays the nose with a 2 per cent. solution of larocain. The patient is then ready for the nose-packing, which is carried out by medical assistants. The packing material consists of thin squares of cotton-wool reinforced by a single layer of gauze and soaked in a 1 per cent. solution of zinc sulphate. The cotton-wool

and gauze are specially prepared for the hospital on large reels one inch wide, and the strip is passed through the zinc sulphate solution and a small toy mangle, which rings out the surplus solution. As it comes out of the mangle the strip is cut in pieces about an inch long. In this way it is possible to prepare squares for 100 patients in about twenty minutes.

When the packing has been carried out the patient is directed to the ionization treatment room. There a number of patients sit along the walls, each being supplied with an ionization set connected to the electrical supply derived from a special battery. The ionization set consists of a small wooden box on which are mounted a sliding resistance, a milliamperemeter, and terminals for the input and output of the current. The electrical battery consists of about thirty Leclanché cells provided with heavy zinc plates that will last several years. Two nurses are in charge of the electrical treatment, each capable of looking after eight to ten patients. After the completion of the treatment, which takes fifteen minutes, the patient is directed again to a medical assistant, who unpacks the nose and fixes the date of the next treatment. With this arrangement it was possible to treat up to 100 patients in a morning (two and a half hours), with only three medical assistants, two reception attendants, and two nurses in charge of the electrical treatment.

Results of Treatment

During last summer 776 patients were treated for hay fever by the nasal ionization method. A questionary sent out to all the patients brought in 460 replies, of which only 432 were suitable for statistical purposes. The following table gives the comparative results of the treatment in 1937 and 1938.

	1937	1938
Patients free from hay fever during the season	9%	18%
Greatly improved	35%	50%
Slightly benefited	46%	25%
Not benefited	8%	6%
Made worse	2%	1%

Nasal ionization for hay fever has thus proved valuable in 93 per cent. of all cases treated. The majority of the patients classified as greatly improved were practically free from hay fever during the season except for one or two isolated attacks, so that it may be justifiable to claim almost 70 per cent. of cures. Of the 432 cases 165 had treatments in both 1937 and 1938. In 45 per cent. of these cases the results were better in 1938 than in 1937, in 44 per cent. the results were the same in each year, in 10 per cent. the results were better in 1937, and 1 per cent. did not benefit in either year.

In 1938, as in 1937, a number of patients were treated for hay-fever conjunctival irritation by ionization of the eyes through the closed eyelids. We have no statistical information about the results of this treatment, but we have gained the impression that it proved beneficial in practically every case.

I wish to express my thanks to our honorary radiologist, Dr. Alexander Orley, who was responsible for the organization of the electrical part of the treatment.

The number of medical practitioners in Poland is given by *Minerva Medica* as 12,215, or one doctor for every 2,833 inhabitants. The proportion of Jews is 33.4 per cent. of the medical profession and 9.6 per cent. of the population. Sixty-one per cent. of the practitioners are settled in towns the population of which forms 13.5 per cent. of the total population. The chief causes of death among Polish doctors are returned as follows: cardiovascular disease 40.5 per cent., tuberculosis 17 per cent., malignant growths 13 per cent., epidemic diseases 8 per cent., and suicide 4 per cent.

Clinical Memoranda

Pneumococcal Meningitis, following Mastoidectomy, Treated with M & B 693: Recovery

Although the recorded cases of pneumococcal meningitis treated by M & B 693 are now becoming numerous, the following case, which occurred last September, may yet be of interest because of its unusual features.

CASE RECORD

A healthy and active schoolboy of 15 developed a typical right acute mastoiditis, and was admitted to the Royal Infirmary, Dundee, on August 18, 1938, under the care of Mr. M. J. Gibson. The following day a right Schwartze mastoidectomy was performed, during which the dura was exposed and found to be healthy: the sinus was not exposed. The patient was put on M & B 125, two tablets thrice daily. A specimen of pus taken from the diseased cells at the time of operation contained the pneumococcus in pure culture: the type was not ascertained.

Convalescence was normal until the fourteenth day, when the temperature and pulse rose. On the nineteenth day the mastoid was reopened; the sinus was fully exposed and found to be healthy. Some further cells were removed. During the dressing of the wound on the twenty-second day the sinus wall gave way. When the bleeding had been controlled a clear fluid—? cerebrospinal fluid—welled up into the cavity. Lumbar puncture was performed, and revealed clear fluid under pressure, with a cell count of less than 1 per c.mm., no increase in protein, prompt reduction of Fehling's solution, and a Lange reaction of 00000000. The chloride content was 730 mg. per 100 c.cm. and the Wassermann reaction negative. The same day the patient was given 10 c.cm. 5 per cent. prontosil, repeated on the following two days in addition to the M & B 125. The temperature remained high and the boy was seriously ill. On the twenty-fifth day he had a rigor. By the twenty-eighth day he had developed pleurisy on the left side with pleuro-pericardial friction: meningeal symptoms became evident that evening, with a temperature of 104° and pulse of 100. A blood culture, taken while his temperature was still rising, was sterile. He was now taken off M & B 125 and given M & B 693, two tablets thrice daily, with a first dose of four tablets. On the following day and for the next eleven lumbar puncture was performed. Smears of the centrifugalized deposit of the cerebrospinal fluid showed the presence of numerous Gram-positive diplococci. At this time both disks showed an early optic neuritis.

The fluid obtained on the thirtieth day was sent to the bacteriologist, who reported the cells to be 2,500 per c.mm. at least, the protein markedly increased, with no reduction of Fehling's solution. No micro-organisms were obtained by culture. On the thirty-first day the cerebrospinal fluid was very turbid: the cell count was 3,266 per c.mm. The patient was delirious and doubly incontinent. There was marked head retraction, kernigism, and extensor plantar responses. The case appeared clinically hopeless. The temperature, which had dropped steadily since the administration of M & B 693, fell to normal that evening, when the continuous muscular twitchings, which had been general for twenty-four hours, disappeared. Again no culture was reported.

Clinical improvement set in the following day, four days after first giving M & B 693. This was maintained, although the optic neuritis grew steadily worse until the thirty-fourth day. Normal plantar reflexes returned on the thirty-fifth day with the return of the abdominal reflex, but neck rigidity and kernigism were present till the thirty-seventh day. M & B 693 was stopped on the forty-first day. Two further lumbar punctures were performed on the forty-second and fiftieth days to ascertain the state of the cerebrospinal fluid, but nothing abnormal was found—in all, a total of fifteen lumbar

punctures were made. Approximately 52 grammes of M & B 693 were given in fourteen days. The temperature fell steadily twelve hours after administration was begun, although the pulse rate was maintained and the clinical condition deteriorated for three days. No toxic effect of the drug was noted.

COMMENTARY

It may be argued that the demonstration of organisms in the cerebrospinal fluid does not prove actual meningeal infection, but this case of clinical pneumococcal meningitis occurred after a purely pneumococcal infection of the mastoid. Had cultural methods been resorted to earlier or culture made from the specimen in which the organisms were seen and before the M & B 693 was given, a positive result might well have been obtained. As it was, pneumococci were definitely not to be cultured from the cerebrospinal fluid on or after the third day of administration of M and B 693.

Reid and Dyke (1938) gave 22.5 grammes of M & B 693 in eleven days to a child of 7 years suffering from primary pneumococcal meningitis, with successful result. In that case no culture was reported from the fifth day, although the temperature fell rapidly after twelve hours. Young (1938) reported a case treated with sulphanilamide where the temperature did not fall till the third day, at which time the cerebrospinal fluid also became sterile.

The patient was last seen in January of this year, when he reported that he was now apprenticed to an architect. His general health was excellent.

I am indebted to Mr. M. J. Gibson for his permission to publish the case.

A. PRATT YULE, M.B., B.Sc.,
Late House-surgeon, Royal Infirmary.
Dundee.

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Central Pneumonia with Hyperpyrexia Treated with M & B 693

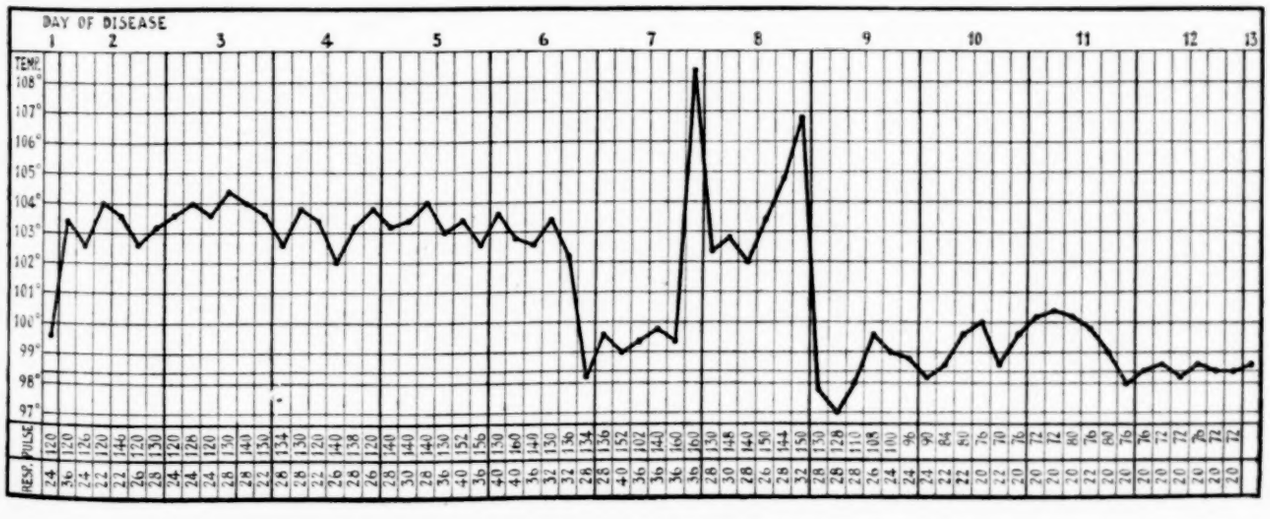
The following case is here recorded on account of its rarity.

The patient was a high-grade feeble-minded boy of 15 years who had suffered from epilepsy since the age of 5 years. On the evening of February 1, 1939, he was warded on account of violent sickness and vomiting, followed by a rigor. The temperature was found to be 99.6° ; the pulse rate was 120, and the respiratory rate 24. The following morning the appearance was suggestive of pneumonia—the face was flushed, the brow bathed in cold sweat, the temperature was 103.4°, the pulse was full and bounding and 120 in rate, and the respiratory rate was 36, while the breathing was laboured. On physical examination nothing beyond a slight degree of diminished expansion could be detected in the lungs. The diagnosis of a central pneumonia was made and treatment instituted.

During the next three days the fastigium varied between 102° and 104.4°, while the clinical picture remained unaltered. On the morning of the fifth day the patient complained of severe frontal headache, and the pupils were found to be unequal in outline and sluggish in their reaction to light. Towards evening he became markedly toxic, restless, and confused, and suffered from recurrent attacks of vomiting. Ice-bags were applied to the cranium and cardiac stimulants and salines administered. This condition remained unaltered until the evening of the sixth day, when the temperature fell to 98.2° and was accompanied by extreme prostration. The following day he was delirious, the temperature was 99°, the pulse was thready and 152, and the respiratory rate was 40. At 6 p.m. he had a typical epileptic fit of five minutes' duration, and following this he became comatose. On examination the temperature was found to be 107.6°, the pulse 160, and the respiratory rate 36. Within the next half-hour the temperature rose steadily, until at 7 p.m. it was 108.2°. At 8.30 p.m. two tablets of M & B 693 were administered, and this was repeated at four-hourly intervals. The patient still appeared gravely ill—he lay with open staring eyes, muttering, and oblivious to his surroundings; he could not be roused, lay plucking at the bedclothes, and had become incontinent. At 4 a.m. on the eighth day the temperature had fallen to 102.4°, but at 10 p.m. it had risen again to 106.8°, while the clinical picture remained unaltered. Two tablets of M & B 693 were administered at two-hourly intervals, and at midnight the temperature had fallen to 98.6°. On the ninth, tenth, and eleventh days the temperature kept within the limits of 97° and 100.4° without there being any change in the patient's condition. On the twelfth day there was a very marked improvement, and from this point until his convalescence on the nineteenth day there were no untoward symptoms.

I should like to express my indebtedness to Dr. T. R. C. Spence, medical superintendent of the Royal Scottish National Institution, for kindly allowing me to publish the case; to Dr. E. Chalmers for her help and co-operation; and to the matron, assistant matrons, and nursing staff of the hospital ward for their unfailing attention and interest in this case.

WILLIAM BLYTH, M.D., D.P.M., F.R.F.P.S.
Royal Scottish National Institution,
Larbert.



Reviews

PAEDIATRICS

Fundamentals of Physical Examination. By George G. Deaver, M.D. (Pp. 299; 126 figures. 12s. 6d. net; 2.75 dollars.) London: W. B. Saunders. 1939.

The 1938 Year Book of Pediatrics. Edited by Isaac A. Abt, D.Sc., M.D. With the collaboration of Arthur F. Abt, B.S., M.D. (Pp. 550; 174 figures. 2.50 dollars; 10s. 6d., postage 6d.) Chicago: Yearbook Publishers; London: H. K. Lewis. 1939.

Notes on Infant Feeding. By G. B. Fleming, M.D., F.R.F.P.S. Second edition. (Pp. 51. 2s. 6d.) Glasgow: John Smith. 1938.

Dr. George G. Deaver is assistant professor in the School of Education, New York University, and his *Fundamentals of Physical Examination* is designed particularly for students, public health and school nurses, and physical educators. It not only sets out in great detail what a non-medical observer can expect to recognize as early symptoms and signs of disease in childhood and adolescence but also attempts to explain what the physician is seeking to discover with his methods of palpation, percussion, and auscultation. Equal prominence is also given to exact methods of physical measurement and certain physical tests. It is difficult to believe that the bulk of this volume is really necessary for lay workers except perhaps as a book of reference, but Dr. Deaver's reputation stands high, and it can only be concluded that the world of American education differs greatly from its counterpart in this country. For any such audience, however, it is difficult to justify certain of the illustrations, such as that of a primary chancre on the penis.

The 1938 Year Book of Pediatrics, edited by Professors Isaac A. Abt and Arthur F. Abt, opens with a valuable survey by the senior editor on "Hormones in Relation to Growth and Development," which is a masterly account of a controversial subject. Another novel feature is a contribution by Dr. William Brown on "Study of the Face and of the Facial Expression of the Sick Child." The rest of the book follows the usual pattern, and the editorial comments are, it may be said, as apt as ever. It is gratifying to note that several important contributions to the *Archives of Disease in Childhood* have been annotated, in one instance with a reproduction of the illustrations.

Professor G. B. Fleming has revised his useful little book called *Notes on Infant Feeding*, and the second edition now published presents an up-to-date account of this important subject set out in an easily understandable manner.

SURGERY OF PAIN

The Surgery of Pain. By René Leriche, M.D.Lyons, LL.D.Glasg., F.R.C.S.Eng. Translated and edited by Archibald Young, B.Sc., M.B., C.M., F.R.F.P.S.G., F.A.C.S. (Pp. 512; 18 figures. 21s.) London: Baillière, Tindall and Cox. 1939.

The work of Professor Leriche on the surgery of the sympathetic nervous system is well known to surgeons in this country, and this account of his experiences is sure of a warm welcome. He has devoted over thirty years to an intensive study of pain as it has to be faced by the surgeon, but it was only with the war of 1914–18 that he began to realize the vast extent of the problem on which he was engaged. This book is an account of his experiences rather than a scientific treatise on the subject. It is an entirely unconventional description of his own observations, of the processes by which he has arrived at the methods he now adopts, and of his own reflections upon the many problems he has had to face. It is not a book for rapid reading but for careful study, for almost every page raises problems to which no complete answer is yet available, and presents ideas which demand the most careful consideration if their full meaning is to be appreciated.

The volume opens with the discussion of the nature of pain and of its different varieties, and then passes on to discuss their physiological significance and their probable basis of origin. Trigeminal neuralgia is then taken up and its pathology and treatment are discussed in some detail. The post-traumatic spreading neuralgias are described and the pain arising from nerve injuries, and this is followed by a discussion on causalgia and its effects. A large section is then devoted to pain due to vasoconstriction, to Raynaud's disease, and to the difficult subject of juvenile arteritis, a section which oddly enough closes with a discussion on arteritis in the aged. There follows one of the most valuable sections of the book, that on angina pectoris, its pathology and treatment. The volume concludes with brief discussions of pain arising from other sources, and especially from visceral disturbance.

By far the most interesting and illuminating method of investigation which the author has employed is that of injecting the sympathetic ganglia with anaesthetic substances such as novocain. His observations on the results of such injections open up a completely new field in surgery, and it is a remarkable fact that the relief given by these injections may be permanent. Only those who themselves have had to deal with cases of causalgia can appreciate all that this may mean.

As we have said, the book is to be regarded rather as an exposition of the author's mind than as a scientific treatise on the subject of pain. As such it will be studied with interest not only by surgeons but by those who have to face pain in its many different forms and to attempt to relieve the suffering it involves. Their thanks will be due not only to Professor Leriche for a brilliant monograph but to Professor Archibald Young for the splendid translation he has produced.

AURAL SURGERY

Surgery of the Ear. Edited by Samuel J. Kopetzky, M.D., F.A.C.S. (Pp. 468; illustrated. 12 dollars.) New York: Thomas Nelson. 1938.

The editor of the *Nelson Loose-Leaf Surgery of the Ear* is Dr. Samuel J. Kopetzky of New York. He describes the book as a series of monographs, and this is a correct statement, for there are eighteen chapters, quite unrelated to one another, by seventeen different authors, Dr. Almour contributing two chapters. These various chapters show individually a high standard of authorship, and vary in character from such general dissertations as the basic factors underlying otitic suppuration, by the editor, and the diagnosis of otitic surgical lesions, by Dr. Ersner, to highly technical and specialized descriptions, such as surgical therapy in otosclerosis by Professor Holmgren—an account of his surgical researches on the relief of deafness in this disease—and the surgery of the facial nerve by Dr. Tickle—an account of the work of Ballance and Duel on the treatment of facial palsy.

Taken as a whole, the reader is presented with a useful account of aural surgery, though some chapters give a more modern impression than others. The section on myringotomy, for example, falls below the standard expected, for under the heading of "Indications" it is difficult to discover any clear indications. These are

concealed at the end of the section under the heading of "Post-operative Care," and the conclusion of the author that "better end-results obtain in a myringotomy performed late than in one done too early—that is, before frank pus has formed in the tympanic cavity," implies a recommendation with which but few aural surgeons would agree, and is based on a misleading analogy. Among the chapters which, by reason of concise statement, clear reasoning, and the excellence of the illustration, are particularly satisfactory are those on the surgery of the acoustic nerve by Dr. Ernest Sachs, and the surgery of Ménière's disease by Dr. Walter Dandy, both neurological surgeons.

The general plan of the book has resulted both in contradictions and in overlapping. An instance of the former is in the surgical management of labyrinthitis, for which incompatible advice is given in Chapters II and VIII, and of the latter in the repeated descriptions and illustrations of endaural surgery—that is, of operations conducted through an enlarged external auditory meatus. The loose-leaf system naturally allows for additions and replacements so that improvements can be steadily supplied, but unless the original plan upon which the book is founded is sound this can only result in a patchwork. There is frequently recurring evidence of lack of co-ordination between the authors, whom the editor either has failed to supply with clear enough instructions or has controlled with too lenient a discipline. Unfortunately the publishers have intensified this impression of a lack of coherent unity by printing the pages in two narrow columns, constantly broken by illustrations, whereby the attention of the reader is much distracted; and, further, the caption at the top of each page gives no indication of the chapter to which it belongs, so that the reader receives no guidance on opening the book.

The book is a useful statement of the present position of aural surgery in the United States, though it offers much that is controversial, and it will no doubt be steadily kept up to date; but it has gross defects in design and editorship, and a great opportunity has been missed of producing a first-class book.

SPINA BIFIDA

Études sur la Spina Bifida. By Jacques Leveuf. (Pp. 330; 176 figures. 75 fr.) Paris: Masson et Cie. 1937.

This new monograph on spina bifida is based on the study of eighty cases, on forty-five of which the chief author has operated. In the majority of the cases the spinal anomaly was confined to the lumbo-sacral region, but one successful case of cervical meningocele is described. Complete and almost complete forms of spina bifida are rather a concern of the anatomist than of the surgeon, and are scarcely mentioned in this book. The author divides spina bifida into four forms: open meningo-myelocele, meningo-myelocele covered with skin, meningocele, and spina bifida with lipomatous tumour. In cases of the first form he considers it unjustifiable to operate, because the few patients that survive remain paralysed and incontinent. In the second form the results are scarcely better, but an occasional satisfactory case justifies the operation. In the last two forms the results should be good.

The author gives an excellent account of the anatomy of the condition as found in his own material, and a chapter by Dr. Sternberg on the development of the spine and spinal cord clarifies its pathogenesis. Dr. Bertrand has contributed a chapter on the accompanying malformations in the spinal cord, and has reported on its condition in Leveuf's post-mortem material. Curiously enough, he does not seem to have met the Arnold-Chiari malformation of the medulla and cerebellum, which is said to be common in cases of meningo-myelocele. The technique described by Leveuf is based on the careful histological study of specimens, and the results he has achieved appear to be at least as good as those of others.

Altogether the book is a useful guide to a difficult subject. While it makes no claim to being a complete treatise, it is valuable as a record of careful work on a large series of cases.

YELLOW FEVER

Fièvre Jaune. By Ricardo Jorge. (Pp. 134; 10 figures. No price given.) Lisbon: Instituto de Higiene. 1938.

This publication on yellow fever presents a summary of the communications and discussions on the disease during the last ten years before the Comité de l'Office International d'Hygiène Publique, to which the author was the Portuguese delegate. As he points out, yellow fever has become of primary importance, not so much because of any increase in its ravages, but because its study has been signalized by a series of impressive discoveries which have proved of fundamental importance in epidemiology and pathology. The opening chapter outlines the work in Africa from 1925 to 1928, when the identity of the American and African diseases was established and Noguchi's theories disproved. It also records the important discovery of the susceptibility of *Macacus rhesus*, which not only opened up an immense field of research and led to the production of an early vaccine, but was an important step in devising a precise method of diagnosis. The next chapters deal with the sanitary campaign in Brazil and the successful elimination of the disease from Rio de Janeiro. An account is then given of the discovery of the monkey-protection test, and later the mouse-protection test—touchstones for the virus—by means of which the extent of the disease was mapped out in Africa and revealed to be much greater than suspected. Further observations on the pathology of the disease follow, and the final chapter records the communications on jungle yellow fever with its interesting and significant implications. The author in his preface states that the story of yellow fever unfolds with the attraction and drama of a veritable film, and in his presentation he has well retained these qualities.

INFECTIOUS FEVERS

Ker's Manual of Fevers. Revised by Frank L. Ker, B.A., M.B., Ch.B. Fourth edition. (Pp. 354; 15 figures; 6 plates. 12s. 6d. net.) London: Humphrey Milford, Oxford University Press. 1939.

The fourth edition of *Ker's Manual of Fevers*, by his son, Dr. Frank L. Ker, senior assistant and deputy medical superintendent at the Little Bromwich Fever Hospital, Birmingham, has appeared eleven years after the last, so that considerable revision and additions have been required. The work on the whole has been brought up to date, especially in the chapter on diphtheria, which contains a description of the various preparations used in prophylaxis as well as a brief account of the various types of diphtheria bacilli, the tellurite medium for diagnosis, the use of aspiration in the treatment of laryngeal diphtheria, and of mechanical respirators in paralysis of the diaphragm. Reference is also made to the use of placental extract in the prophylaxis of measles, Felix serum in the treatment of typhoid fever, and of sulphanilamide in cerebrospinal meningitis. On the other hand, we find no mention of the serum or vaccine prophylaxis of typhus, the occurrence of post-vaccinial encephalitis,

or, indeed, of encephalitis following measles, chicken-pox, or rubella, or of amyotrophic paralysis as a symptom of serum sickness. As minor errors we may mention the presence of an accent on the first syllable of Debré's name (pp. 58, 268, 347, 349) and of only one "f" in Hoffmann's, while the term "röteln" for the last forty years at least has been spelt in Germany without an "h," though this fact has not been generally recognized in this country. Dr. Ker appears to have ignored our notice of the last edition (*Journal*, 1927, **2**, 311), in which, as in the present one, there was no account of erythema infectiosum or exanthema subitum and in which two photographs (still retained) disguised rather than illustrated scarlet fever and a serum eruption. These, however, are minor defects in a book which enjoys a well-merited reputation as a practical work on fevers.

Notes on Books

The catalogue is the most important part of any library, and the book by Mr. J. L. THORNTON, *Cataloguing in Special Libraries* (Grafton and Co., 10s. 6d.), shows the methods in use in selected libraries, excluding public and county ones. The book includes cataloguing systems in universities, medical and scientific societies and institutions, Government Departments, business houses, commercial, technical, and polytechnic institutions, and schools. It indicates the numerous methods at present in vogue and the aim of the author to promote co-ordination. This is a difficult matter so far as special libraries are concerned. The task of librarians is to provide a catalogue of use to readers, and some of the elaborate classifications with numerous decimal points which one meets tend to confuse them. Thus, in special libraries, which are usually conducted with a minimum staff, the catalogue is arranged to help the reader. Uniformity in special libraries of a similar nature would undoubtedly be an asset. The chapter on alphabetization should be carefully studied by all librarians. As Mr. Thornton points out, the two methods followed at present cause confusion, and information is overlooked. He expresses a wish that the revised form of the Anglo-American Code will contain rules for guidance in alphabetical arrangement. The book should be of interest to all who use special libraries, but particularly the librarians of these will find it of great value. It indicates the methods of colleagues in similar and different spheres of special library work and could be used as a basis for co-ordination. The author has produced a book on a neglected subject in a worthy manner.

Nelson's loose-leaf publications on medicine and surgery, each of which consists of eight volumes, were reviewed in the *British Medical Journal* of November 13, 1937. Since that date we have received, regularly, renewal pages which keep both series up to date. These arrive every six months, so that each year approximately 500 pages of the series are replaced. This plan prevents the work from becoming obsolete, as is the case with most textbooks, and it has no doubt proved acceptable to many readers in this country and the British Dominions as well as in America.

Leçons du Jeudi Soir à la Clinique Tarnier (Paris: Vigot Frères, 60 fr.) consists of a series of addresses given by senior members of the staff of the Lyons Hospital on obstetrical and gynaecological subjects. They are interesting, chiefly as imparting the clinical experiences and beliefs of vigorous and thoughtful men. The first lecture is the most exciting. It is illustrated by reproductions of wonderful Caesarean sections back to the sixteenth century—the surgeon with a razor, the patient, who must have been moribund or dead, with a cheery smile. A discussion on domiciliary versus hospital maternity service strikes a familiar note. The friendly, human tone makes this book pleasant as well as useful reading.

The late Dr. OTTO LEYTON'S advice to his diabetic patients appears in a little book, *The Diabetic's Vade Mecum* (John Bale, Sons and Curnow, Ltd., 2s. 6d.). This contains a summary of the essential things every diabetic should know, in the usual clear and distinctive style of the author.

Preparations and Appliances

AGLA ATOMIZER

The "Agla" atomizer produces a vapour-like spray from aqueous or thin oily liquids which come into contact with glass only. It is so constructed that the larger globules of atomized liquid are effectively retained and only the finer spray is emitted. Having a flat base and being fitted with a rubber stopper, the atomizer may conveniently be used as a container for the medicament. When filling the atomizer the level of the liquid should not be more than half-way up the delivery tube. A dropper is provided for transferring medicaments to the atomizer, which is manufactured by Burroughs Wellcome and Co. of Snow Hill Buildings, London, E.C.1.

HIGH-TENSION GENERATOR FOR RADIOLOGY

What is described as the first high-power *x*-ray unit to be manufactured in Great Britain on a quantity production basis has been introduced by Watson and Sons (Electro-Medical), Ltd. (Sunic House, Parker Street, Kingsway, W.C.2), under the name of "Roentgen IV," a high-tension generator for diagnostic purposes. It is designed for use with any modern make of *x*-ray tube, including the most powerful available, as it is capable of delivering loads up to 600 milliamperes (mean) and high-tension voltages up to 100 kV (peak). Two of its outstanding features are its straight-run automatic control, whereby the milliamperage remains constant at all kilovoltages and vice versa, and its kilowatt "synchrotimer" which automatically prevents overloading of the tube. This "synchrotimer" gives exposures of from 1/50 of a second to 8 seconds, is said to be accurate to within one impulse (that is, 1/100th of a second), and has contacts interlocked with the tube and milliamperage selector switch in such a way that it is impossible to make an exposure if the dial is set to a value greater than that which the tube in the circuit can safely withstand. The power now used in *x*-ray work makes it all the more necessary to take extreme care of the life of *x*-ray tubes and cables, and in this apparatus the whole design is directed to that end. It has also the merit of silence, the high-tension switch and main contactor being almost inaudible, and the fact that it is of British manufacture ensures that service facilities are always available, including the co-operation of the technicians responsible for the design and construction. The generator is the subject of an illustrated booklet which may be obtained on application.

NICOTINIC ACID DIETHYLAMIDE

"Nicamide" (made by Burroughs Wellcome and Co.) is nicotinic acid diethylamide. This substance has a powerful stimulant action on the vital centres of the medulla, and in particular on the respiratory centre. It is recommended for use in all conditions associated with shock and depressed circulatory and respiratory states. It is supplied in 25 per cent. solution, and can be given orally, intravenously, or intramuscularly.

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EQUINE ENCEPHALOMYELITIS IN MAN

Some eight years ago an epizootic of encephalomyelitis broke out among horses and mules in the San Joaquin Valley of California, and Meyer, Haring, and Howitt[1] found it was due to a hitherto unknown virus. Two years later the disease occurred in certain of the Eastern States of America, and Tenbroeck and Merril[2] and Giltner and Strahan[3] isolated a virus from the affected horses which, though very similar, differed in certain respects from the virus of Meyer and his colleagues. It was more virulent for laboratory animals—a fact in keeping with the greater severity of the natural disease which it gave rise to—but the principal difference between these two viruses was in their antigenic make-up; they were entirely distinct serologically.

During the last few years much more has come to be known about the virus of equine encephalomyelitis. The existence of these two serologically distinct American strains—the Western and the Eastern—has been confirmed, and two further types have been discovered. One of these was isolated from cases of equine encephalomyelitis in Russia—the Moscow 2 strain—and only last year Beck and Wyckoff[4] reported on an apparently new strain coming from Venezuela. It has been also established that the virus of equine encephalomyelitis is distinct from other viruses, such as those of Borna's disease, lymphocytic choriomeningitis, St. Louis encephalitis, Japanese B encephalitis, vesicular stomatitis, and poliomyelitis, capable of affecting the central nervous system of man and other animals. Equine encephalomyelitis would seem therefore to arise in various parts of the world and to be caused by a specific virus of which there are at least four immunological types. The disease appears in the summer months and disappears with the colder weather of autumn. This seasonal incidence, and the fact that the disease occurs in low-lying swampy land, suggested that the mosquito might be a vector, and it has been demonstrated that both the Western and Eastern varieties of equine encephalomyelitis can be transmitted experimentally by a number of species of mosquito of the genus *Aëdes*.

Although Meyer[5] reported in the year 1932 three cases of encephalitis in men associated with sick horses, and stated that man might be susceptible to the equine virus, it was not until last autumn that definite proof of this was forthcoming. Last summer equine encephalomyelitis broke out in epidemic form in various parts of the United States. Massachusetts seems to have been affected with especial severity, and at the same time as this outbreak in horses there were a number of human cases of encephalitis. The human cases, although not directly associated with the diseased horses, appeared in those districts where the equine disease was prevalent and the curves of the two outbreaks were coincident. Furthermore, the severity of the human illness, the high mortality, and the age incidence—more than two-thirds being in children under 5—distinguished this form of encephalitis from the St. Louis encephalitis and encephalitis lethargica. L. D. Fothergill, J. H. Dingle, S. Farber, and M. L. Connerley[6] were the first to discover the cause of the human disease. A boy of 7 years was admitted to the Children's Hospital, Boston, with high fever, generalized rigidity, and coma. The cerebrospinal fluid contained 2,000 cells per c.mm., 85 per cent. of which were polymorphonuclears, and the protein was raised to 190 mg. per cent. The patient died forty-eight hours after admission, and necropsy showed oedema and acute congestion of the brain and cord, general visceral congestion, pulmonary oedema, and early interstitial pneumonia. A suspension of the brain, which was bacteriologically sterile, when injected into the brains of Swiss mice produced an encephalitis ending fatally in two to three days. Passage in mice was achieved; the virus passed both Berkefeld V and N filters, and was virulent for both rabbits and guinea-pigs. A further experiment demonstrated that two guinea-pigs immune to the Eastern equine encephalomyelitis were also immune to this new virus, whereas three normal animals and a guinea-pig immune to the Western variety all succumbed, thus proving the identity of this new virus and the virus of Eastern equine encephalomyelitis. H. W. Schoening, L. T. Giltner, and M. S. Strahan[7] have injected the virus isolated by Fothergill and his colleagues into three horses—one normal, one immune to the Western, and a third immune to the Eastern form of equine encephalomyelitis. The two former animals developed a fatal encephalitis and the last horse remained well, thus confirming the conclusion previously arrived at by Fothergill. C. Wesselhoeft, E. C. Smith, and C. F. Branch[8] report the findings

[1] *Science*, 1931, **74**, 227.
[2] *Proc. Soc. exp. Biol., N.Y.*, 1933, **31**, 217.
[3] *North Amer. Vet.*, 1933, **14**, 25.
[4] *Science*, 1938, **88**, 530.
[5] *Ann. intern. Med.*, 1932, **6**, 645.
[6] *New Engl. J. Med.*, 1938, **219**, 411.
[7] *Science*, 1938, **88**, 409.
[8] *J. Amer. med. Ass.*, 1938, **111**, 1735.

in eight fatal cases in Southern Massachusetts. Seven of these were in infants or children and the eighth in a man of 50. The onset was abrupt in the four infants but more gradual in the older patients; in two cases the disease ran a remittent course. Microscopical examination of the central nervous system in the seven cases showed an acute encephalomyelitis with foci scattered throughout the brain and cord but with greater incidence in the pons, medulla, and basal ganglia. The focal lesions consisted of intense vascular engorgement, perivascular and parenchymatous infiltration with lymphocytes, mononuclears, and neutrophil leucocytes, and marked degenerative changes in the nerve cells. Although in three of these cases the picture was complicated by the pre-existence of whooping-cough, there can be little doubt that in all of them the encephalomyelitis was due to the equine virus, for L. T. Webster and F. H. Wright[9] succeeded in isolating the Eastern form from the brains of four, including two from the patients with whooping-cough.

Concurrently with these investigations in Massachusetts Howitt[10] isolated a virus which she identified with that of Western equine encephalomyelitis from a fatal case of encephalitis in a boy aged 20 months in California. As already pointed out, Meyer contemplated this possibility in 1932, and that Howitt's case is not a chance happening is suggested by the six cases of human encephalitis among farmers in Minnesota in the summer of 1937, described by C. M. Eklund and A. Blumstein.[11] They remark that the Western type of the equine virus is the only one known to produce disease in horses in Minnesota, and they further state that the serum from one of the recovered cases had neutralizing antibodies for the Western virus. There seems no doubt, therefore, that both Western and Eastern types of the equine virus can infect man and cause a particularly severe and serious form of encephalomyelitis. The equine disease takes on an added importance, and in those countries where it occurs a new public health problem has arisen.

There are several questions to be solved. How does the disease spread to man and how is it to be prevented? Does infection in man always result in overt disease, or do some human cases run a mild or subclinical course and thus escape detection; and is the horse the principal reservoir of infection? With regard to the mode of spread, everything points to the mosquito as the vector, though R. F. Fermster[12] reports that no mosquito caught in the affected area during the 1938 Massachusetts outbreak was found carrying the virus. That the horse is not the sole or even the most important reservoir of the virus is supported by some most illuminating facts. L. T. Giltner and M. S. Strahan[13] reported the susceptibility of the pigeon to the equine virus in 1933, and three years later P. Remlinger and J. Bailey[14] demonstrated that a number of species of bird—vulture, stork, goose, duck, harrier, and English blackbird—were susceptible to experimental infection. L. D. Fothergill and J. H. Dingle[15] have now isolated the Eastern type of virus from the brain of a pigeon which had contracted the disease naturally in the affected area in Massachusetts. Apparently pigeon breeders in that area reported unusual losses from disease at the time of the equine epidemic. And E. E. Tyzzer, A. W. Sellards, and B. L. Bennett[16] have isolated the same type of equine virus from four pheasants found in a paralysed condition on a range in Connecticut and demonstrated its infectivity for Rhode Island Red chicks and quails. These authors suggest that various bird species form the natural reservoir of the virus, and that only when the disease in them rises above a certain epidemic level does the condition spread to the horse and man. This view is rendered more likely by the fact that the disease in horses is highly fatal, and because, as C. Tenbroeck, E. W. Hurst, and E. Traub[17] have shown, the virus disappears so soon from the blood of the infected horse. Obviously there are several questions to which an answer must be found before our understanding of the epidemiology of this disease is complete. But the great strides our American colleagues have already taken in this direction make it likely that they will soon fill in the existing gaps in our knowledge.

[9] *Science*, 1938, **88**, 305.
[10] Ibid., 455.
[11] *J. Amer. med. Ass.*, 1938, **111**, 1734.
[12] *Amer. J. publ. Hlth.*, 1938, **28**, 1403.
[13] *Science*, 1933, **78**, 63.
[14] *C. r. Soc. Biol.*, Paris, 1936, **121**, 146; **122**, 518; **123**, 562.
[15] *Science*, 1938, **88**, 549.
[16] Ibid., 505.
[17] *J. exp. Med.*, 1935, **62**, 677.

A DEFENCE BUDGET

In introducing his Budget the Chancellor of the Exchequer called attention to a striking contrast with one of the Gladstonian Budgets; the extraordinary increase in the total amount of money involved is an indication of the number of taxpayers now concerned and the extent to which the demands of the Exchequer reduce the effective purchasing power of incomes and thereby affect the comforts and habits of the citizens. That fact is as plain to-day as it was even in the later stages of the great war. The task of a Chancellor is almost as difficult as it is important. Throughout the autumn and winter his watchdogs at the Treasury are scrutinizing and criticizing the Depart-

mental estimates in an endeavour to keep them down to financially manageable dimensions. Later a scheme has to be prepared to provide the aggregate amount of expenditure that Parliament has approved, and the choice between all alternatives must be by the personal decision of the Chancellor, and must remain his secret until he lays his final plan before the Cabinet. But in normal times at least he knows within a very small margin what sum he will have to find from taxation. This year, however, Sir John Simon had to deal with a preliminary question of vital importance—How much of the aggregate amount required could properly be borrowed, and therefore what would be the amount of the balance which had to be raised by taxation?

About a month ago Sir John Simon indicated that of the total amount of Defence Expenditure—then estimated at £580,000,000—he would be prepared to borrow £350,000,000, leaving £230,000,000 to be raised from taxation. It was possible on that basis to make some guess at the probable Budget proposals, but the whole question was complicated by the subsequent decision to double the Territorial Force and by the expectation that the diminished general business prosperity in 1938–9 as compared with 1937–8 would affect adversely the Exchequer receipts in 1939–40. Clearly there would be a deficiency to be made good, but on Tuesday afternoon how much it would be and what steps would be taken to make it good were, so far as concerned the taxpayers, in the lap of the gods—or, rather, in the Chancellor's dispatch box. On the basis of the ratio of borrowing indicated above, and assuming that no further Defence Expenditure would be incurred, the problem would have been fairly simple, as the figures disclosed that the gap between estimated expenditure and anticipated revenue on the basis of present taxes would be only £4,000,000. But in fact there would be further special expenditure—mainly on the Territorial Forces—amounting to £50,000,000, and Sir John intimated that he felt that £20,000,000 of that sum should be provided from taxation, thus increasing the gap to £24,000,000. This is to be found, not by some spectacular new tax or by a great increase in one or two taxes, but by spreading the increase over a moderate number of direct and indirect taxes. In the past few years the ratio between these two classes has moved slightly against the direct taxpayer, mainly through increases in the standard rate of income tax, and the Chancellor's proposals go a little, but only a little, way towards restoring the former ratio for the coming year. As, however, the additional licence duty on private cars will in the main be paid by "direct" taxpayers, their relative position will not be much improved. This increase was one of the Budget surprises, and is likely to come in for serious criticism, on the ground that the distinction between private cars and trade vehicles is often one of degree rather than quality. A medical practitioner or a commercial traveller whose private use of the car is 10 per cent. or less is entitled to treatment very similar to that given to the owner of a trade van. However, the new duty of 25s. per horse-power does not come into force until January 1, 1940, so the grievance is not likely to rankle very acutely. For some years now the Medicine Stamp Duty has been dying of what in the more dignified field of the surtax would be called "legitimate avoidance," and is now to be abandoned and interned. Apparently the scheme has broken down and it is not found practicable or it is not thought worth while to construct a new one. The Chancellor will have a modified regret at losing the £500,000 it brought in last year, but perhaps cannot be expected to share the regrets of those who appreciate such taxation for reasons other than those of national finance. The standard rate of income tax remains unaltered—indeed any other decision would, in view of Sir John's statement a month ago, have been an unpleasant surprise—but surtax on incomes between £2,000 and £8,000 is increased by 5 per cent.; surtax on incomes over £8,000 is increased by 10 per cent., and estate duty on estates over £50,000 is increased by 10 per cent. A reduction in the entertainments tax in "living theatres" and the new tax on photographic film were interesting minor features of the Budget.

We do not expect the Chancellor to meet with serious difficulty in passing his proposals into law. He has made a reasonable choice between borrowing and "paying cash" for the national requirements, and has followed tradition in spreading the increased burden over the general community. Most taxpayers will feel that bad as things are they might have been worse, and will accept the proposals with general acquiescence.

THE MENOPAUSE

There is probably no aspect of gynaecology that commands such constant and widespread attention as does the physiology and pathology of the menopause. A popular belief, and one fraught with grave dangers, attributes to the "change of life" most of those ills to which a woman of 40–50 is subject. As every practitioner and gynaecologist knows, the menopausal syndrome can be varied in its disguise, distressing to the patient, and at times difficult to treat successfully. With recent advances in endocrinology new light has been thrown on many of its problems, some of which have been clarified while others have been made

temporarily more obscure. In view of these changing ideas the time was opportune for the symposium on the subject of the menopause that was held at Amsterdam in October last. It was introduced by Dr. Bastiaanse, professor of gynaecology at Amsterdam University, who gave a survey of the gynaecological aspects of the menopause. The therapeutic measures now available were reviewed by Dr. P. M. F. Bishop of Guy's Hospital, London, and Dr. Vandeputte-Vanhove of Ghent; Professor Aschheim of Paris concluded the series by discussing the present conception of menopausal endocrinology.

The opening speaker defined the menopause as "the period intervening between the initial decrease of ovarian function and the establishment of a new equilibrium." The definition was a happy one in that it combined a reference to the endocrinological basis of the condition with an assurance that equilibrium would be established eventually. Every practitioner has learned that such an assurance wisely and convincingly given to a patient disturbed by her menopausal symptoms often yields results comparable to the best achieved by sedatives and hormones. The reaction of different physical types of individual to the strain of this transition period was summarized as varying from the obese tendencies of the pyknic type to the vasomotor and emotional disturbances characteristic of the inter-sex type. Dealing with the aetiology of menopausal bleeding the speaker stressed the necessity for always investigating these cases for carcinoma before regarding them as being due to endocrinal dysfunction. Professor Bastiaanse declared his belief that the surgeon should conserve ovarian tissue wherever possible because of the severity of symptoms following operative castration as compared with the less severe disturbances after hysterectomy without removal of the ovaries. In view of the controversy that has at times centred on this question it is interesting to note from the report now published that his statement was not challenged in the subsequent discussion. At Guy's Hospital experience in the treatment of the menopausal syndrome had convinced Dr. Bishop that every symptom arising from ovarian deficiency could be alleviated by the administration of oestrogenic hormone. He pointed out that symptoms could be due either to a diminished production of hormones or to a diminished sensitivity of tissues to them. In support of this he referred to the low sensitivity of the uterus to oestrogenic stimulation during pregnancy. This contribution to the subject was valuable in that it introduced a possible factor which has not been widely appreciated. The clinical objections to overdosage—uterine haemorrhage, headache, swelling of the breasts, and the raising of the threshold of sensitivity—were mentioned and the speaker described the technique he adopted to avoid them. It consisted in giving 1,000 units daily for a fortnight, after which the dose could be increased if necessary until the desired response was obtained. Once an optimum dose had been discovered for a particular case it was given for three to six months and then decreased and discontinued. Progress was checked by the examination of vaginal smears and by recording the daily number of hot flushes. The technique of staining these smears by a haematoxylin-eosin-thionon-blue method was described. Dr. Bishop referred to certain dermatological lesions which, occurring at the menopause, could be cured by oestrogenic hormone. He cited a case of severe hyperkeratosis of the palms of the hands which responded to this treatment, and referred to a similar case reported in 1937 by Kaufmann in which the sole of the foot was affected. The danger of forgetting the old-fashioned remedies which had proved so effective in the past was stressed by Dr. Vandeputte-Vanhove, who believed that in selected cases these remedies were superior to hormones. As examples she stressed the value of sedatives in emotional and vasomotor disturbances, and claimed that it was a minority of women who required hormone therapy to relieve their menopausal distress. For those cases of irregular bleeding due to the persistence of unruptured follicles she advised the use of gonadotropic hormone, which in her experience was effective even when curettage had failed. The great value of oestrogenic hormone in treating pruritus vulvae due to oestrin deficiency was also referred to by this speaker. Professor Aschheim differentiated between the natural menopause and the menopause that was artificially induced. He believed that whereas the former often caused little distress to the patient the latter almost invariably resulted in a disturbance of varying degree. In explanation of this he said that although it was believed until recently that the menopausal ovary was functionally inactive it was now known that even the post-menopausal organ was capable of changes involving definite luteal activity. Professor Aschheim believed that further progress would be made in the therapeutic use of hormones when it was possible to determine their quantitative variation in the blood and to know exactly how they acted on the tissues. He concluded with the encouraging statement that recent advances in technique gave rise to the hope that this progress would ultimately be possible.

HEALTH SERVICES AND HEALTH

This week, under the title *Britain's Health*, in the sixpenny series of "Pelican Specials," there is published a book of great public and topical importance. It is by Mr. Mervyn Herbert, and is based upon—indeed, is mainly a summary of—the *P E P Report on British Health Services*, which was issued towards the end of 1937 and described and commented on in our issue of December 18 in that year (pp. 1227 and 1235). That report was widely recognized as probably the most important and comprehensive survey of the subject ever made; but it formed a bulky volume, costing half a guinea. Indispensable as that report is to all who are deeply interested in, or definitely responsible for, those services, its size and cost necessarily placed it out of reach of that large public which is in a real and practical way concerned with the health of the community and nation. It is therefore a notable event that there should now be available a handy book which is within the purchasing power of almost all readers, giving everything in the original report that is essential for less expert and more popular purposes, bringing that report abso-

lutely up to date, and embodying opinions and recommendations of an urgent and far-reaching character. The factual accuracy of the original report was remarkable, and the very few exceptions which were pointed out in our review have been corrected. Perhaps one remaining point in this connexion may be noted, though it was not an inaccuracy at the time the book was written. The reference to recent cancer legislation is to the form in which it was introduced as a Bill, and is not strictly correct as referring to the Act as it has emerged from Parliamentary consideration. Lord Horder has written an appropriate and thoughtful "foreword" to the book. It is interesting to note how largely in this concise abbreviation and adaptation of the larger report the British Medical Association is in evidence as having initiated or influenced health policies and activities and as pointing the way to future developments and action. This is, of course, as it should be; but the fact is here incidentally brought out in a way that will probably appear remarkable to many readers of the book. The actual suggestions for reform remain as they are in the larger work. They are contained mainly in the two chapters headed "Reform of National Health Insurance" and "Health Services Reviewed." As is now well known, "P E P" (Political and Economic Planning) favours the method of financing a general practitioner service by compulsory insurance contributions to the extent of half the cost, the remainder being found by Government grant, and some valuable figures are given as to how this might work out. The value of combined clinics for general practitioners and specialists is perhaps overestimated, and the statement that every patient in need of institutional treatment therefore probably needs to be treated by a specialist cannot be accepted. But every practitioner who studies this small book and reads with it relevant parts of the larger report and of the report of the Departmental Committee on Scottish Health Services will be in a position to pass an intelligent judgment on proposals made by the British Medical Association, especially those embodied in the booklet "A General Medical Service for the Nation."

CHRONIC SUBDURAL HAEMATOMA

Chronic subdural haematoma, to which attention has been drawn again by Coblentz of Baltimore and Kaplan of New York,[1] occurs more often than is generally realized. It is certainly commoner than, for example, middle meningeal haemorrhage. The lesion consists of a gradually accumulating encysted mass of partly clotted blood, which may not give rise to pronounced symptoms until some days, weeks, or even months, after a head injury—often on the forehead or occiput. Blows in the sagittal axis of the skull are more likely to give rise to this condition because, as Wilfred Trotter has suggested, displacement of the brain in an antero-posterior direction may tear the small venous tributaries entering the superior longitudinal sinus, whereas when blows fall on the side of the head the falx protects the brain against transverse displacement. Headache, lethargy or somnolence, and mental changes are most constantly noted, but the symptomatology is variable. Thus, the mental symptoms may lead to mistaken certification and the asylum rather than to the operating theatre. Chronic subdural haematoma is more frequent in men than in women, and signs of slight increase in intracranial pressure may be present, particularly mild papilloedema. The lesion is so slowly progressive, however, that limb palsies are but rarely seen and localization from the neurological signs alone is often impossible. When the condition is suspected burr or trephine openings are advisedly made over each hemisphere, since the condition is sometimes bilateral. Openings in the post-parietal region on either side not only serve to establish the diagnosis but enable the surgeon to determine whether the lesion is bilateral and to evacuate the haematoma. This may be done by the use of a soft rubber catheter, warm saline, and suction, but where there is well-organized clot present it may be necessary to reflect a bone flap. Of the fourteen cases reported by Coblentz, ten were male and four female; their ages varied from 24 to 74 years. Five had papilloedema, and mental disturbance was a prominent symptom in ten. Only one case was bilateral. There were two deaths following operation. Of Kaplan's fifteen cases, thirteen were male and two female, their ages ranging from 8 to 76 years. Two patients had bilateral lesions; all had headaches; six showed mental changes; and six had papilloedema. There was one post-operative death. The appearance and persistence of headache and lethargy some days or weeks after a head injury should bring this condition to mind and call for investigation. It must be remembered that the lesion is usually progressive, and the patient may become demented or pass into coma and die from clot compression if the chronic subdural haematoma is not evacuated.

[1] *Surgery*, 1938, **4**, 194, 211.

"TRAUMATIC DIABETES"

When diabetes is discovered after an accident a claim is sometimes made that the trauma caused the diabetes, though there is seldom any evidence of the urine having been tested before the accident took place. Some patients have been reported to develop severe diabetes soon after head injury with concussion; on this evidence the claimant with post-traumatic diabetes is usually given the benefit of the doubt in matters of compensation. On the other hand, so infrequently did diabetes appear in wounded and shocked patients in the last war that the relation of trauma to diabetes has been entirely denied. There has been, in fact, no definite statement in medical literature that an accident can cause diabetes. Viggo Thomsen[1] has tabulated and considered critically eighty-one cases of "traumatic diabetes" reported in the literature. His tables show little evidence in favour of the existence of this condition. Most of the patients had no previous record of a test for sugar in the urine, and many developed diabetes too long after the accident to justify the assumption of a

[1] *Acta med. Scand., Supplement*, 1938, **91**.

causal relation. Dr. Thomsen has also carefully studied material from hospitals in Aarhus and Copenhagen, and he describes his investigation of the carbohydrate metabolism in 144 previously normal accident cases of all types. The urine and blood were tested as soon as possible after the accident and at varying times later; in 100 cases complete blood-sugar curves were made. He found that 63 per cent. of these cases showed a temporary disturbance of carbohydrate metabolism, usually lasting only a few days. Patients with head injury and concussion showed this no more often than those with other somatic injuries. This carbohydrate disturbance he ascribes to an upset and overstimulation of the sympathetic nervous system: a most obvious explanation, though he was less successful in his attempts to prove it by experiments with ergotamine. The effect of injury on 100 cases of diabetes was also studied. Of these, sixty-nine were known to have had diabetes for which some sort of treatment had been given before the accident, and only nineteen showed any exacerbation which could be considered permanent. Of the remaining thirty-one patients in whom the diabetic condition was diagnosed after the accident only one was an acute severe case, and in the other thirty the type of diabetes was so mild that it might easily have remained undiagnosed before the accident. This study reveals that there is no clear evidence in favour of "traumatic diabetes." The author admits that, theoretically, extensive trauma directly involving the pancreas may produce diabetes, but thinks that other physical traumata are unable to cause the disease; trauma may exacerbate an existing diabetes, but only temporarily and not very severely. This expression of opinion on a question involving such important legal considerations is to be welcomed, but it remains to be seen whether Dr. Thomsen's facts and arguments, which are presented rather diffusely, supply a complete answer to the claim for compensation in any case of "traumatic diabetes."

DETOXICATING HORMONE OF THE LIVER

Thirteen years ago Professor Sato[1] prepared a liver extract which he considered contained a detoxicating hormone in sufficient concentration to protect rabbits against the injection of 3 per cent. solution of ammonium chloride into the peritoneal cavity. This extract he named "yakriton" (from the Sanskrit "yakrit"= liver). A method of standardization in "rabbit-ammonia-units" (R.A.U.) was devised, later dependent on the protection provided by the hormone against rises in the ammonia content of the blood after the injection of ammonium carbonate. Since this time Sato and his co-workers[2 3 4 5] have published a number of papers from the department of paediatrics, Tohoku Imperial University, on the effects of yakriton on albuminuria and on scarlatinal and experimental nephritis. They concluded that this hormone decreased albuminuria, prevented scarlatinal nephritis if used early and continuously, and caused survival in animals subjected to experimental uranyl and mercuric nephritis. The results were, however, better in uranyl than in mercuric nephritis. Dr. Mitsuru Hasegawa has now extended the research to chromic nephritis. Healthy rabbits were subjected to liver-function tests on three occasions, and those animals with a poor ammonia-detoxicating function were selected for experiment. The experiments were performed within ten days of the last liver-function tests. One per cent. aqueous solution of potassium bichromate was injected subcutaneously in amounts of 1 to 2 c.cm. per kilo body weight. Each experiment was duplicated, using an animal treated with liver hormone and an untreated control. Estimations of blood urea were carried out before the injection and every day after it. In the first experiment twenty rabbits were used, and ½ R.A.U. per kilo of the hormone given one hour before the injection of 1.5 c.cm. potassium bichromate per kilo and on each subsequent day. The mortality was 80 per cent. in the control animals and 40 per cent. in animals which had received the hormone. In the second experiment 1/10 R.A.U. was used and a second injection of 1 c.cm. potassium bichromate given on the day after the initial 1.5 c.cm. per kilo. Of sixteen rabbits the mortality of controls was 87 per cent., compared with 62 per cent. of animals receiving the hormone. In the third experiment, in which only eight rabbits were used, 1 R.A.U. of hormone was given (as in Experiment I) and 2 c.cm. per kilo of potassium bichromate. Here the mortality of control animals was 75 per cent. and that of the hormone animals 100 per cent. In each experiment the rise in blood urea was less in the animals receiving the hormone than in the controls, whilst the survival of those that finally succumbed in the first experiment was longer than that of the controls. The author concludes that whereas the use of 1 unit per kilo of hormone was possibly even harmful, the use of ½ unit had a beneficial effect in experimental chromic nephritis. This was, however, much less striking than in the case of uranyl nephritis. A somewhat similar study is reported by Dr. Takeo Minagawa[6] from the same laboratory, relating to the effect of the hormone on desiccated Formosan cobra venom. Healthy rabbits were chosen in the same manner as for Hasegawa's experiment, eighteen couples being used: 0.4 or 0.5 mg. per kilo of desiccated cobra venom dissolved in distilled water was injected into the interscapular space, whilst five minutes later ½ R.A.U. per kilo of hormone was injected subcutaneously into half the number of animals used. Blood was taken five minutes before and during the first, third, sixth, and twelfth hour after injection. The author found that whereas thirteen out of the eighteen control animals died, there were only two deaths among the animals given the hormone, and the survival period of these two was longer than that of the control animals which died. Blood examination of controls showed a marked leucopenia and nuclear shift, whereas in the hormone animals there was a leucocytosis and slight nuclear shift.

[1] *Tohoku J. exp. Med.*, 1926, **8**, 232.
[2] Ibid., 1936, **28**, 156.
[3] Ibid., 1933, **20**, 399, 408.
[4] Ibid., 1936, **28**, 335.
[5] Ibid., 1938, **32**, 163.
[6] *Tohoku J. exp. Med.*, 1938, **32**, 177.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

THE PREVENTION AND TREATMENT OF SHOCK

BY

Colonel E. M. COWELL, D.S.O., T.D., F.R.C.S.

The term "shock" should not be used unqualified. In civilian surgery it should be preceded by the word "surgical" or "traumatic," and in military or air-raid surgery the term "wound-shock" (1917) is accurate and descriptive. This terminology avoids confusing the condition with "shell-shock" or shock resulting from a transient psychical disturbance.

Wound-shock is not a nervous phenomenon; indeed, the nervous system occupies only a small part of the picture. The conception of wound-shock as being a condition of *failure of the circulation* is all-important. It may be defined as a condition of lowered vitality of the body resulting from injury or accident, which leads to failure of the circulation, with lowering of the blood pressure, reduction of the body temperature, diminution of the blood volume and concentration of the blood, intracellular anoxaemia, and, in untreated cases, subsequent death. An excellent discussion of the theories of traumatic shock may be found in Cannon's book (1923a). None of the theories, however, were very helpful in the matter of treatment, and vast numbers of wounded died from shock in the first years of the great war.

Findings of Shock Committee in 1917

Early in 1917 a Shock Committee was established in London, and the first memorandum on the subject was published. Experimental work was undertaken by Bayliss and others in this country, and clinical observations were made by Fraser, Hooper, and Cowell in France. W. B. Cannon arrived from Harvard and took an important part in the investigations, working with Bayliss in London and Fraser in Béthune. It was felt that much might be learned from studying the actual conditions under which men were wounded, and by making clinical observations immediately the man was hit and in the next few hours while he was being transported to the casualty clearing station. No. 33 Casualty Clearing Station was the receiving hospital where Fraser and Cannon worked in the operating theatre and laboratory respectively, and Cowell made observations in the trenches on Hill 70, following the casualties to the regimental aid posts and advanced dressing station in Loos. From this study it became clear that wound-shock could be classified into two types: primary, which was rare, and occurred only in wounds, which were almost immediately fatal; and secondary—the common type—which was of slow onset, and occurred in the presence of one or more of four definite factors.

Cold

Observations were made in September, 1917, on Hill 70 in front of Loos. It was a cold moonlight night, with a chilly wind blowing. A soldier's blood pressure had just been taken when a hand grenade was thrown over from a German post and wounded him in the foot and neck, relatively trivial wounds. The blood pressure, which was 110 mm. a short while previously, was at the same level immediately after the wound. A bearer party carried him shoulder-high through shallow trenches over the hill to the regimental aid post. He had no blankets and became steadily colder and colder. When he arrived at the regimental aid post an hour later he was pulseless. Two hours afterwards at the advanced dressing station, which he reached on a wheeled stretcher, he was still pulseless, and a serious view was taken of his condition. He was hurried off to Béthune in an ambulance car, and was found at the casualty clearing station to have a pressure of 80 mm., with no palpable pulse. After being warmed up in bed and being given hot drinks the shock soon passed off in the absence of any heroic measures of treatment.

McDowall (1923) quotes work by Dale and others which shows that histamine shock can be induced in certain carnivora only when the suprarenals are destroyed. He also states that Cramer and Crowden have shown that these glands are exhausted by cold. Holt and Macdonald (1934) also say that, in experimental shock, "if no attempt was made to sustain the normal body temperature, shock was maintained much more readily."

Pain

In war wounds pain is always present, but it is difficult to estimate this factor by itself. An opportunity, however, arose of observing the blood pressure in a case of renal colic. The pressure dropped from 130 to 60 and only rose after fifteen minutes, when the patient could no longer stand the pain and morphine was given. A few minutes later the pressure rose to its original level. Crile has advised blocking the afferent nervous impulses in order to prevent shock. This is not necessary provided that pain is checked by the administration of morphine or a suitable general anaesthetic. I performed a forequarter amputation in a feeble lady of 70 for sarcoma of the upper end of the humerus. Gas-and-oxygen was administered and the pressure taken every five minutes. The brachial plexus was left intact until every other structure had been divided, and no fall in blood pressure occurred.

Haemorrhage

There is bleeding to a variable extent in all war wounds. In air raids, where the wounds are generally severe and multiple, and when immediate first aid is difficult owing to the large numbers of casualties that may occur at one spot, bleeding is an important factor in the initiation of shock. The quantity of circulating fluid becomes diminished, leading to deficient intracellular oxygenation. This weakens the heart's action, so establishing a vicious cycle. Bodily fluid is also lessened by the profuse sweating which accompanies shock. In the case of the fighting soldier an anhydraemia may exist before he is wounded and be an important pre-wound factor in the production of shock.

Toxaemia

Early one morning I met a stretcher party carrying a strong burly lance-corporal who had just had his left leg blown off by a trench mortar. Efficient first aid had been applied, and I saw him attended to by the regimental M.O., who readjusted the dressing on a stretcher heated by a primus stove placed underneath. The man was quite

fit, the blood pressure was 115 mm., and the pulse rate 96. I accompanied him on his two-hour carry to the A.D.S. in Loos, and found on arrival there that the blood pressure was maintained but the pulse rate had crept up to 120. He was not in pain, was quite warm, and there was no bleeding. At the casualty clearing station two hours later the pressure had fallen and secondary shock was present. Early gas gangrene was found; the stump was reamputated and he recovered. This case I regarded at the time as an example of bacterial toxaemia. Another case was seen where the arm was amputated for a shattered humerus soon after the receipt of the injury. Four hours later I saw the man on his way down the line, and found him surprisingly fit, with a blood pressure of 140 and a pulse rate of 90. Here all traumatized tissue had been removed and the toxic factor eliminated.

Much experimental work has been done on the absorption of toxins produced by trauma of the tissues. Bayliss and Cannon showed in 1918 that shock followed severe traumatization of the animal's leg with nerves cut but blood vessels intact, and concluded that this shock resulted from toxic absorption. Holt and Macdonald in 1934 repeated these experiments with negative results. M. I. Smith (1927–8) claims that "direct methods have failed to demonstrate a depressor substance in the blood of a shocked animal." McDowall (1923) admits that toxic or chemical shock exists, and refers to the well-known fact that shock may "occur acutely when a tourniquet is removed from a severely damaged limb and the products of damaged tissue are allowed to enter the circulation." This author also agrees that this shock is enhanced by cold and by chemical poisons such as ether and chloroform. From the experimental point of view toxaemia is not yet accepted as a causal factor of shock. Clinically, however, there appears to be no doubt in the matter.

Pathological Findings in Wound-shock

Reduced Blood Volume.—Some of the most important observations in wound-shock were made by Keith (1919). This observer measured the blood volume in a series of cases and found it reduced to 52–85 per cent. of the normal; at the same time there was a plasma reduction ranging from 62–90 per cent. He described three groups:

1. Compensated cases, with slight symptoms; pulse 90–110 and blood pressure above 110 mm. The blood volume never falls below 80 per cent. of the normal, and the plasma is not reduced in proportion.

2. Partially Compensated Cases.—There is a history of a small haemorrhage; the patient is restless, cold, thirsty, and he vomits; pulse rate 120–140, blood pressure 70–80, and blood volume 65–75 per cent., with slow dilution of the plasma, 70–80 per cent. reduction only.

3. Uncompensated Cases.—Condition very serious, with extreme restlessness, thirst, and vomiting. The extremities are cold and the pulse impalpable. The blood pressure may be as low as 60 mm., and the heart rate 120–160. The blood volume is below 65 per cent. and the plasma volume correspondingly reduced.

Cannon (1923b) concludes his chapter on blood volume: "The dictum uttered by the older generation of surgeons, that 'shock is haemorrhage and haemorrhage is shock,' is true."

Where is the Lost Blood?—A certain amount of loss may be accounted for by bleeding. However, shock may occur without haemorrhage, and in these cases there is evidence to show that the lost blood accumulates in the capillaries. Simultaneous red corpuscle counts of blood from the veins and capillaries show a greatly increased count in the latter.

Transudation of Plasma.—Blalock (1930) found that trauma in the thigh of an animal results in extravasation of serum into the loose tissues of the groin and flank. On weighing both lower limbs after careful amputation he found the difference in weights amounted to at least 4 per cent. of the body weight, or about half of the total calculated blood (blood being one-thirteenth of the body weight).

Increased Viscosity of Blood.—Cannon points out that the viscosity of the blood is complex, consisting of (*a*) the internal friction of the plasma, (*b*) the friction of the corpuscles with the plasma and with each other, and (*c*) the frictional contacts of the corpuscles with the vessel walls, especially in the capillaries. Trevan (1918) states that internal friction rapidly rises as soon as the corpuscles reach a concentration of 60 per cent.; they have a tendency to stagnate, especially when the arterial pressure is decreased. This stagnation, in addition to haemorrhage and loss of plasma, would further augment the amount of blood which is out of currency and consequently conduce to failure of the circulation.

Effects of Reduced Blood Volume and Blood Pressure.—Vasoconstriction occurs in certain organs, reserving the diminished blood volume for essential organs (Cannon). As the blood volume continues to diminish, the pressure falls and all parts of the body begin to suffer from disturbances of the circulation. From his study of the subject of cerebral anoxaemia Cannon concludes: "It is probable that, as the result of reduced blood volume and lowered blood pressure, the transportation of oxygen is greatly decreased in amount." Many observations on the reduction of the alkali reserve, basal metabolism, and changes in blood and urine are described in Cannon's book, but will not be discussed here. With regard to the importance of the time factor in the development of shock, the gradually damaging effect of persistent low pressure is of the greatest consequence in both understanding and treating shock. When the vasomotor centre has lost its capacity to maintain vascular tone there is no known remedial agent that will bring back the blood-flow to its normal condition. Even blood transfusion leads to no permanent gain. At this stage the damage due to insufficient oxygen is too great to permit of resuscitation. From the practical point of view a pressure of 80 mm. or lower, if not raised within four hours, will have a fatal result.

Prevention of Wound-shock

The Clinical Picture.—The main symptoms are well known. In looking round a resuscitation ward filled with wounded awaiting anti-shock treatment, the most striking features are the cyanosis of lips and finger-tips, the coldness of the extremities, and the restlessness. Sweating and vomiting are seen in the earlier stages.

When the causal factors of this condition became clear, and with the recognition that secondary wound-shock was the commoner variety, the conception of the idea of prevention occurred. This gave great encouragement to the war-weary regimental medical officer, and a new campaign to combat shock was begun with enthusiasm. All concerned in the early treatment of wounded, both medical officers and other ranks, were taught the four causal factors. Every endeavour was made to get the casualty to hospital before shock could develop. *Cold* was prevented by supplying hot-water bottles, hot bricks, and hot drinks. Stretcher parties were encouraged to carry a blanket-packet in forward areas. This consists of a blanket folded in a waterproof sheet to the same size as a stretcher pillow, and is carried in the same way in a

closed stretcher (*R.A.M.C. Training Manual*, 1935). In the regimental aid post the man was given three blankets, folded in such a way that there were four thicknesses behind him as well as in front. Also before being sent on he was thoroughly warmed by a stove under his stretcher and by a drink of hot sweet tea. The ambulance cars were warmed as well, and cases were actually observed where wound-shock disappeared on the journey, entirely owing to the warming measures adopted.

Pain should be prevented by efficient first aid, careful handling, and adequate splinting of injured limbs. If these measures are carried out properly morphine will not be necessary. *Bleeding* is treated by efficient first aid, the judicious use of the tourniquet, and possibly by simple surgical intervention at a forward dressing station. *Toxaemia* may be minimized by efficient immobilization of a damaged limb, but is chiefly combated by rapid evacuation.

The front-line application of the Thomas splint for wounds of the lower limb affords an illustration of the use of the above-mentioned methods of preventing shock.

Treatment of Established Wound-shock

Treatment depends on a recognition of the four factors and a knowledge of the pathology of the condition. When large numbers of wounded are being received, and if the military situation permits, definite resuscitation wards are organized for the treatment of wound-shock, both at the main dressing station and at the casualty clearing station. Careful judgment and close watching will determine the right moment for surgical intervention, when the *cause* of the condition will be dealt with and removed. To operate in shock is dangerous; but in certain cases and with adequate precautions surgical intervention must be risked to save the patient's life. For example, after a massive blood transfusion and with gas-and-oxygen anaesthesia it is justifiable to perform an amputation, open an abdomen, or close an open pneumothorax.

In the resuscitation ward the patients are warmed by hot-water bottles, electric cradles, hot-air cradles, or stoves under stretchers on trestles. Morphine is given for pain, in repeated small doses if necessary. The deficiency of circulating fluid (anhydraemia) is made up by giving hot drinks, saline by rectum, and, in severe cases, intravenous injections of hypertonic glucose saline with insulin, gum, or blood. In Spain, where blood transfusion was highly organized, it was found that 10 per cent. of wounded required blood, and in the resuscitation wards, where blood was given to all moribund cases and to those considered hopeless, some 20 per cent. recovered sufficiently to stand operation.

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A special cruise has been arranged by the *Bruxelles-Médical* at the end of August in connexion with the New York Exhibition. Starting from Havre on August 29 on the steamship *Champlain*, visits will be paid to New York, Philadelphia, Atlantic City, Washington, Chicago, Detroit, Toronto, and the Niagara Falls. The price for first-class travel and hotels will be 747 dollars and the tourist class 585 dollars. A detailed programme of the cruise may be obtained from the travel section of the *Bruxelles-Médical*, Boulevard Adolphe-Max 29, Brussels.

THE NEW "WESTMINSTER"

FEATURES OF RECONSTRUCTED HOSPITAL

The new Westminster Hospital, which the King opened on April 20, stands near the Thames at Millbank, about six hundred yards from the site of the old hospital in Broad Sanctuary whose quasi-Gothic embattlements have fronted the Abbey for over a hundred years. It is a nine-storied structure on an island site bounded on three sides by quiet streets and on the fourth by St. John's Gardens. The gardens separate it from the nurses' home and medical school, a block of similar construction opened about a year ago.

Tradition in hospital planning is broken in several respects in this new building. The most obvious architectural departure is the making of a private covered carriageway and footpath right through the hospital from Horseferry Road to Page Street. Along this road, the foundations of which are buried in anti-vibration material, are various entrances—for out-patients, for in-patients, for visitors, and for accidents and emergency cases, with separate doors for those brought by ambulance and for the walking casualty in order that the latter may not be unduly distressed by the sight of someone gravely injured. There is also a separate entrance for laundry, leading direct to the sorting-room, and another for goods. In time of war this road can be sealed at either end by air locks so that gassed patients may be received and decontaminated before being taken to the wards. Again with a view to emergency the whole structure of the hospital has been specially buttressed against air attack. The three top floors are of solid concrete, able to resist incendiary bombs, and the walls of the whole of the steel-framed structure have never less than 14 inches of brickwork, which is considered sufficient to protect the building from splinters and blast.

Out-patient Departments

An original feature is the arrangement for out-patients. The depressing hall where patients with sundry ills mingle and wait is no more. It is replaced by a distribution centre on the ground floor, where the out-patients, according to the obvious nature of their case, are sent at once in lifts to the appropriate consulting-rooms on the upper floors, where each out-patient department is in structural contact on the same level with wards devoted to similar cases so far as this is possible. In this way a common medical, nursing, and auxiliary service staff is available for both in-patients and out-patients, thus saving the staff some fatigue, promoting economy in space and in other directions, and also assisting continuity of treatment should the out-patient in time become the in-patient. On the first floor are the ophthalmic and the ear, nose, and throat departments, both of them excellently equipped with the most modern apparatus for examination and treatment. On the floor above are the children's department and the orthopaedic department, to which latter is attached a fracture clinic, a gymnasium for remedial exercises, a ward unit of twenty beds, and a plaster room with special apparatus. The third floor is devoted to the surgical department, the fourth to the medical, and the fifth to the gynaecological and maternity department, with a treatment room for minor operations and investigations.

The hospital contains just under 400 beds, as compared with about 250 on its old site. Westminster has always believed in the small ward, and the typical unit ward in the new building consists of twenty-five beds—eleven on the male side, eleven on the female, and three single rooms—all being under the control of the one medical and nursing administration. In each of the wards two beds at one end are partitioned off to secure privacy for the very ill. The wards throughout are so arranged that so far as possible cases of the same type are grouped together, with, as already stated, the related

out-patient department on the other side of the corridor. The unit on the fifth floor consists of twenty-six beds for expectant mothers and twenty for gynaecological patients.

A complete unit for children on the second floor has balconies on two sides facing south and south-west. A feature of this unit is the single-cot rooms surrounded largely by glass panelling for patients where infection is suspected. Another idea is the "mothers' flat," where infants who must be nursed by their mothers while in hospital receive treatment under home conditions, the mothers living in the flat during the period of the children's illness. An "incubator" room has also been set aside for premature babies.

Radium and X-ray Clinic

On the lower ground floor the radium (6 grammes) which is in possession of the hospital, and has hitherto been employed at its radium annexe at Hampstead, is housed, also some modern *x*-ray and electrical equipment, the former including an apparatus for tomography. There is also a good physiotherapy department, with equipment for light and heat treatment, short-wave therapy, and inductotherapy, and on a small scale the bathing facilities of a spa.

On the sixth floor accommodation is provided for forty-three private patients paying the full cost of maintenance, and in addition beds are set aside in various parts of the hospital for patients with limited incomes able to pay part of the cost of their treatment. The pamphlet issued in connexion with the completion of the hospital states that the importance of the fullest co-operation with the patient's own doctor is recognized. A trained almoner has her office on each floor, and it is part of her business to see that at the patient's first attendance he brings a full history of his illness from his doctor, that the doctor is made aware of the fact that his co-operation with the hospital is cordially invited, and that after the patient's discharge a full record of treatment and an indication of whatever after-treatment may be necessary at home are furnished to him.

The hospital has four main and four subsidiary operating theatres. The main operating block is on the seventh floor, but there is an emergency theatre in the casualty department, close to the ambulance entrance. On the ground floor, too, are administrative offices, medical staff room, dispensary, and a library—the hospital claims to be the first to include a patient's library (accommodation for 3,000 volumes) in its building plans. The kitchens are on the seventh floor, above all the wards, and at the very top of the building—a fine architectural crown—is the chapel with its cedar-wood ceiling, and on its external wall, looking out over West London, floodlit by night, a white cross in relief.

The hospital has cost £850,000. Two wards, named after the King and the Queen and to be used for cases treated by irradiation, have been provided out of the amount of £25,000 raised by subscription at a banquet at the Mansion House soon after the Coronation.

Royal Opening Ceremony

The opening ceremony took place in a large marquee in grounds opposite the hospital, some 2,500 guests being present. The King, who was accompanied by the Queen, with Dr. Walter Elliot, Minister of Health, in attendance, was received by the Mayor of Westminster and by Lord Wigram, president of the Hospital, Mr. Bernard Docker, chairman of the Building Committee, and the Matron. Several presentations were made, including the senior physician and senior surgeon, Dr. Hildred Carlill and Mr. E. Rock Carling. Lord Wigram, in inviting the King to declare the hospital open, said that its 220 years' history had been one of uninterrupted evolution, in wards, laboratories, and medical school alike. The planning of the new building, which was the result of research in this country and abroad, and the attention to detail to ensure economical and efficient administration, made it a model for other institutions of its kind.

The King said that for the Queen and himself the occasion was one of much interest. The long and famous history of the hospital and its reputation for progress were being worthily maintained. He mentioned the link between the royal household and the hospital; any member of the household who needed in-patient treatment had been accommodated in its wards. The Nurses' Home, opened by Queen Mary a year ago, bore her name, and to mark the present occasion he had agreed that the children's department should bear the names of his daughters and be known as the Princess Elizabeth Wing and the Princess Margaret Rose Wing. He was happy to learn that the need for co-ordination had been recognized by the hospital authorities, and arrangements made for close co-operation with patients' own doctors and, in certain cases, with the local authorities. "Those whose generosity has made this great achievement possible," said His Majesty in conclusion, "and the committee and staff who have devoted so much of their energy and leisure time to its completion, must be gratified when they look upon the fine result of their labours." He then pressed a button which opened the hospital gates, while a fanfare of trumpets was sounded. Prayers of dedication were offered by the Dean of Westminster.

Mr. Bernard Docker, in expressing the gratitude of the governors of the hospital for the honour conferred on the new building by the royal opening, said that it had been his pleasure and a most interesting duty to visit with members of his committee and the staff many of the modern hospitals in this country and elsewhere to learn first hand of any new methods of organization or equipment. They were impressed by the vast hospital reconstruction which was going on abroad, and it was fitting that he should record his thanks to the architects, administrators, and medical officers of those institutions for their courtesy and assistance; but from their visits they returned convinced that the standard of comfort and service available to the in-patient in modern hospitals in this country was as efficient as anywhere. They had therefore adhered to the small, homely wards typical of the old hospital, adding single bedrooms for those needing special quiet. They were not satisfied, however, with the accommodation available even in modern hospitals for the treatment of the out-patient, and in planning the new building they had departed from tradition in this respect. The facilities provided would ensure a more prompt and fuller medical and nursing out-patient service, also closer co-operation with the private doctor. It was their ambition to provide group, if not individual, appointments for consultations and for out-patient treatment. He also added that a friend had provided oxygen service to almost every bedside to avoid any possibility of delay and inconvenience. On the financial position, the whole sum required, with the exception of the last £10,000, had been received, and he and Sir Edward Meyerstein had guaranteed this outstanding amount so that the cost of the project might be met in full.

After the ceremony their Majesties were conducted over the building by the chief officers of the hospital, members of the honorary medical staff being present in the different departments to explain their particular facilities. It was an hour and a half before they left.

The Anglo-Yugoslav Children's Hospital at Kamenica on the Danube has marked its twentieth anniversary by issuing a general report on the work. The hospital was founded by Dr. Katherine S. Macphail, who is still its medical superintendent, and from the beginning the chief source of support has been the Save the Children Fund. The new building was erected in 1931. This replaced the original hospital in Belgrade, which was for many years the only children's hospital in the whole of Yugoslavia.

OPHTHALMOLOGICAL SOCIETY OF UNITED KINGDOM

ANNUAL CONGRESS IN LONDON

The annual congress of the Ophthalmological Society of the United Kingdom was held in London from April 20 to 22, under the presidency of Dr. T. HARRISON BUTLER (Birmingham). It attracted an unusually large attendance from Great Britain and Eire, and France, Germany, Holland, Norway, Italy, and the United States were represented by distinguished visitors. Apart from one set discussion on the problems of refraction, to which nearly twenty speakers contributed, there were eighteen separate papers, as well as several cinematograph and other demonstrations at the Middlesex Hospital and elsewhere. Dr. Butler devoted his brief presidential address to a discussion of the anatomy and physiology of the anterior capsule. Incidentally he expressed the view that the so-called capsular glaucoma was a myth; he was at a loss to understand why so many such cases were recorded in Scandinavia.

Problems of Refraction

The second morning of the congress was devoted to problems of refraction. Mr. C. B. GOULDEN opened with an outline of general principles, including the use of test types, lenses, and frames, and Mr. A. H. LEVY with a description of refinements or attempts to obtain more accurate results—as, for example, with the ophthalmometer or keratometer, which gives an exact measure of the refractive power of the anterior surface of the cornea.

Mr. R. AFFLECK GREEVES dealt with clinical aspects. The public, he said, had a pathetic faith in glasses, and was convinced that glasses preserved sight. Glasses, in his view, were often ordered unnecessarily, especially for distance, and patients were told that they must wear glasses constantly even though no discomfort or disability was experienced without them. Many myopes got on perfectly comfortably without glasses for constant wear. The most common result of errors of refraction was headache. Morning headache was a common symptom, especially after concentrated work the previous evening, when no discomfort might have been felt. Pain from the occiput radiating down the arm was a symptom of ocular strain, especially from near work. In migraine the underlying cause was always much deeper than a refractive error, but there was a group of cases in which such an error was the exciting influence. The question whether the wearing of glasses had or had not any effect on the progress of myopia was hardly a problem of refraction, but Mr. Greeves doubted whether any real evidence had been produced that such was the case. It was not true that loss of accommodating power advanced *pari passu* with age. Different persons showed great diversities in this respect. He regarded 46 as the earliest age at which any extra-presbyopic correction should be given, but many persons did not need such correction until considerably later. Errors of balance were best left uncorrected if causing no symptoms, and often no symptoms were caused until middle life, although the error must have been present much earlier. The prescribing of glasses for special workers, such as writers and musicians, called for extra consideration. Half a dioptre less than reading correction was generally right for the pianist. For very fine work, such as tapestry weaving, some patients might tolerate an over-correction with the addition of prisms to help the convergence. Finally, said Mr. Greeves, there were a certain number of people who would never be satisfied with any glasses, most of them presbyopes who complained bitterly of being unable to read without discomfort.

A subsequent speaker, Mr. J. P. F. LLOYD, also mentioned what he called the "boomerang" patient, who was always found sitting on one's doorstep. In his opinion it was worth while to exercise a good deal of care and patience in dealing with these people. Some practitioners told them rather curtly to keep on with their glasses, with the result that they went to someone else, who perhaps made a trifling adjustment and achieved correction. It was well to check the centering, and sympathetically go over the subjective condition of the patient.

Art or Science?

Mr. W. H. MCMULLEN declared that the prescribing of glasses so as to make a person comfortable was an art with no rigid rules. It could not be based solely on scientific management, however accurate. The patient's symptoms, the nature of his work, his mentality, as well as the clinical condition of his eyes, all influenced the advice to be given with regard to glasses. Mr. BASIL GRAVES said that he had been interested to be told by two Continental oculists that they regarded astigmatism as an "English symptom," and one of them said he always expected an English patient to exhibit it. It seemed to Mr. Graves desirable for some authoritative body to endeavour to teach the public that the wearing of glasses was not a mystery, that spectacles were merely a convenience for getting clear sight, and that their use might be no more "medical" than that of opera glasses at a theatre. If this could be said with authority then the competitive private practice of ophthalmology would take on a more attractive aspect.

Several technical points arose on the discussion on refraction. Two French ophthalmologists, Professor TERRIEN and Dr. RENÉ ONFRAY, urged the use of the diploscope in routine testing. So simple and cheap an instrument, they said, would give an accurate answer to the usual question, "Will the patient sustain his spectacles without strain?" Wing Commander P. C. LIVINGSTON discussed refraction in its relationship to latent deviations, and Dr. VICTOR PURVIS the estimation of astigmatism by the use of crossed cylinders and the streaked retinoscope. Mr. THOMSON HENDERSON likened the myope to a low-geared car which was all right for hilly country, but required a top gear to give a decent performance on the level, and the hypermetrope to a highly geared car, good on the level, but requiring a second gear for uphill work if strain on the engine was to be avoided. He expressed the view that there were thousands of young people, not having reached the years of presbyopia, who, without having any appreciable refractive error, were wearing glasses which were of little value to them. The practice of the art of refraction was too often a prelude to the indiscriminate giving of glasses.

Dr. PERCIVAL HAY said that test types were, after all, the best, particularly for astigmatism. It was quite possible for the more expensive and elaborate tests to go wrong, even with a patient who was a trained scientific observer, and in the end it came back to test types. Mr. E. B. ALABASTER urged those who were constantly examining for errors of refraction to use their own right eye for the patient's right, and their left for his left. This avoided fatigue on the part of the examiner. When he himself made both eyes share the task he got no more headache at the end of the out-patient session. A way of avoiding fatigue in reading was to move the head slightly rather than, as so many people did, to move the eye backwards and forwards across the lines. After several other speakers had taken part in the discussion it was closed by the President with the presumably cynical remark that refraction was neither a science nor an art, but a trade!

The Fundus in the Diabetic

Dr. A. J. BEDELL of New York brought forward a large number of colour slides—which had, however, to be viewed stereoscopically to be appreciated—of the fundus in diabetic patients. In some ensuing discussion Dr. BEATSON HIRD said that the photography of the fundus by the colour methods now available was of great value in following up cases and recording the differences in the fundus from month to month. It was his privilege to work in the Birmingham General Hospital, where there

was a diabetic clinic, and all cases presenting fundus conditions and loss of vision were referred to him. It was very disappointing in these cases that from the earliest stages of fundus change it was possible only to predict, in the majority, that they would go from bad to worse in spite of treatment. Even when the patient was brought to a sugar-free condition it did not impede the progress of the retinal changes once these had definitely started. The most important changes were very minute, circular, dark, almost black, haemorrhages. It was these which were so devastating and gave rise to such a bad prognosis. The haemorrhages formed in the centre of the vitreous, going forward to the posterior surface of the lens, and gave rise to such fibrous-tissue formation that sometimes the whole optic disk was clouded by fibrous tissue.

Professor A. J. BALLANTYNE referred to the frequency with which the retinal veins were distended in the diabetic. Often they took a tortuous course; side-knots and beading of veins were not infrequent changes. Mr. JOHN MARSHALL pointed out that these retinal conditions occurred in what to the diabetic physician were the unexpected cases—mild cases, and significantly and predominantly in women whose diabetes could be controlled usually by diet alone, without insulin. The retinitis or haemorrhage found in arteriosclerosis, in contrast, was a superficial haemorrhage, and occurred in a different layer. Dr. BEDELL agreed that it was the mild case of diabetes which showed the retinal change. A special problem was the juvenile diabetic. As a result of insulin his general health could be maintained, but this was the very patient who developed changes in the retina, and these did not respond to treatment.

Treatment by Diathermy

Several of the communications touched on the use of diathermy in ophthalmic practice. This indeed was the subject of the Bowman Lecture, delivered in connexion with the congress by Professor H. J. M. WEVE of Amsterdam. Diathermy, he said, had a wide field of application in ophthalmology, thanks to the possibility of getting strictly limited effects with accurate dosage, the fact that the treatment did not cause shrinking scars, but very soft and flexible ones, and, above all, its facility for being applied to the interior of the eye without opening the bulbus. Professor Weve discussed the use of diathermy in intraocular tumours and in glaucoma. Another wide field of application was the modified sclerotomy, with letting off of fluid, in chronic inflammation and intraocular haemorrhages. Trans-sclerotic extraction of foreign bodies from the interior of the eye was much facilitated by diathermy. The greatest successes of diathermic surgery were in the treatment of detachment. Professor Weve showed a colour film made in his clinic to demonstrate his method. The use of the colour film, by the way, was a feature of the congress. Mr. H. B. STALLARD showed an exceptionally fine colour film prepared for the instruction of students in the main principles and steps of certain ophthalmic operations (not diathermy).

Dr. T. J. PHILLIPS read a paper on the therapeutic use of short-wave diathermy in ophthalmology, and stressed its advantage over earlier methods in view of the portability of the machine, the lessened risk of burns, the safe use of an eye after trauma or operation, the depth to which the heat was controllable, and the shortened time in which effect on the eye was obtained. Mr. J. P. F. LLOYD spoke of the value of the long-wave diathermy current in the treatment of increased ocular tension. His experience was that this form of treatment was often successful as a primary measure in cases of acute and subacute glaucoma of every type, and could often at least defer operation on an acutely inflamed eye.

Operative Procedures

New operative or other expedients were the subject of a number of papers. Dr. W. J. W. FERGUSON demonstrated bipolar electrolysis in the treatment of detachment of the retina. The chief advantages were ease of access and absence of adhesions. Mr. LINDSAY REA described the uses of the curved retrobulbar needle, principally in the operation for cataract. Dr. HARALD GJESSING described Holth's method of iridencleisis for chronic glaucoma—a method, he claimed, which, especially combined with meridional iridotomy, gave a fairly certain and lasting result without exposing the eye to any considerable risk later on of cataract, late infection, or sympathetic ophthalmia. He had performed it in 252 cases of chronic glaucoma. Professor HANS LAUBER urged a combination of iridectomy with cyclodialysis in cases of glaucoma refractory to single operations. Professor DE GRÓSZ of Budapest discussed the relative merits of iridectomy and cyclodialysis. During thirty years he had performed the former operation 2,773 times, and the latter 1,006. In later years cyclodialysis had been his method of choice more frequently, and the immediate result had been favourable in 87 per cent. of cases. Dr. HARRISON BUTLER claimed certain advantages for his own method of trapdoor iridectomy. Dr. KHALIL of Cairo said that the operation of cyclodialysis was widely practised in Egypt in cases of secondary glaucoma.

The briefest reference only can be made to a number of other papers. Dr. W. J. B. RIDDELL read an interesting one on multiple factors in hereditary eye disease. One pedigree which he had investigated contained colour-blindness, blue sclerotics, deafness, and fragilitas ossium. Mr. F. A. JULER dealt with the occasional cases of persistent hypotony which occurred and caused anxiety after sclero-corneal trephining. Mr. J. MINTON discussed the position of the one-eyed worker in industry. One-eyed people could be divided into two groups: (1) those who have had an amblyopic eye from early life, and who suffered few handicaps at work, entering most trades and professions, and (2) those who had lost an eye in adult life, and who, after a period of visual readjustment, often returned to pre-accident employment. Mr. E. WOLFF discussed some aspects of the blood supply of the optic nerve and retina; Mr. J. ADAMSON and Mr. E. F. FINCHAM the effect of lenses and convergence on the state of accommodation of the eye; and Mr. GIBSON TAYLOR the effect of enucleation of one eye on the growth of the face. Mr. Taylor had investigated fifty cases following removal of an eye in childhood. Enucleation before the age of 7 years resulted in an aberration of development in both size and shape of the orbit.

The congress "ended in smoke," the last subject discussed being tobacco amblyopia, on a paper by Mr. JAMESON EVANS. Dr. HARALD GJESSING of Norway said that many cases of tobacco amblyopia were found in his country during the war. They occurred among people who had not over-indulged in either alcohol or tobacco. They were discovered to be due to the shortage of good butter. Dr. H. M. TRAQUAIR said that the cause was something present in tobacco, not a distillation product. Tobacco amblyopia followed from the use of snuff, so it must be something quite apart from smoking. It might occur at any age, but the peak incidence was at about 55.

THE ANNUAL BANQUET

On the evening of April 20 the annual banquet of the Ophthalmological Society was held at the Langham Hotel under the chairmanship of the president, Dr. T. Harrison Butler, with whom at the high table, besides a number of distinguished foreign ophthalmologists, were Dr. Robert Hutchison, President of the Royal College of Physicians, Mr. Hugh Lett, President of the Royal College of Surgeons, Lieutenant-General W. P. Macarthur, Director-General A.M.S., and Sir Girling Ball, President of the Royal Society of Medicine. In proposing the toast of "The Society" Dr. Harrison Butler said that this Congress in London was notable because three other allied bodies were meeting at the same time as the Ophthalmological Society, and therefore they had with them many honoured guests from over-seas. This was the most largely attended dinner that had been held and the first at which ladies were present as guests. He reminded his hearers that, like all good things in ophthalmology, the Society

came out of Moorfields, and owed its origin in 1880 to a group including Bowman, Critchett, Nettleship, and other great figures. It had welcomed many distinguished Bowman lecturers from abroad. Recalling two important decisions taken by the Society in past times—to retain its individuality apart from the Royal Society of Medicine, and to merge with provincial ophthalmological societies—the President ended with tributes to some of his predecessors in office. The health of the guests was proposed in a comprehensive speech by Mr. Charles Goulden, who remarked on the unusually large number of officers of international bodies present that night, and regretted the absence of Professor de Grósz. Among those he mentioned were Professor Félix Terrien of Paris, Professor J. Lauber of Warsaw, Professor W. Löhlein of Berlin, Dr. F. T. Tooke of Montreal, Dr. Park Lewis, Professor von Szily, and the Bowman lecturer, Professor Weve of Utrecht, whose pioneer work was acknowledged by all. Mr. Hugh Lett and Air Vice-Marshal A. V. J. Richardson, Director of Medical Services R.A.F., responded to the toast, and the President's health was submitted in warm terms by Mr. R. Foster Moore.

ST. JOHN OPHTHALMIC HOSPITAL IN JERUSALEM

The report for 1938 of the St. John Ophthalmic Hospital in Jerusalem, belonging to the Venerable Order of St. John of Jerusalem, possesses particular interest from the fact that it deals with a period in which there have been unusual difficulties owing to the troublous times in which the country has been involved. The work of the hospital, which is concerned only with defects and diseases of the eyes, is well known to all who reside in Palestine and the Near East, and its benefits are available free to everyone of whatever race or creed. The work of the Order of St. John in this country, and throughout the British Empire, is more especially associated with the St. John Ambulance Association and Brigade, upon which such heavy duties have recently fallen.

Events of the Past Year

During the year two events of particular interest took place. First, photographs of the King and of the Queen, which were signed by their Majesties, and also a portrait of Her Majesty Queen Mary, were unveiled by the High Commissioner of Palestine at a ceremony held in the hospital, and are hung in the out-patients' hall. Secondly, a tablet has been erected to commemorate the visit to the Holy Land of the Archbishop of Canterbury, Prelate of the Order. The tablet records the fact that the last of his predecessors to make the pilgrimage was Archbishop Baldwin, who died at the siege of Acre, in A.D. 1190.

While the number of patients attending was smaller than in previous years, due to the difficulties of travel in the country, some idea of the magnitude of the work done may be realized from two items alone which appear in the "Statistics of Diseases" table. Thus there were 12,225 cases of trachoma and 840 cases of different kinds of cataract treated during the year. The hospital is under the charge of Sir John Strathearn, who is resident there, and it is largely due to his enthusiasm, altruism, and indefatigable energy, and to those who are inspired by his example, that so great a good is done; and it can be said that there is no form of treatment, not excluding that demanded by the recent numerous advances in ophthalmology, which is not dealt with with the highest skill. The influence of the hospital is not confined to what is done in the institution itself, but work of an educative nature has been organized by training Arab nurses to combat and prevent the spread of conjunctivitis and trachoma, which are so special a scourge and are responsible for so much blindness.

Financial Needs

Little has been spent on the hospital for many years, and the time has come when additional accommodation and equipment is needed. It is felt that not even the special difficulties that the present disturbed condition of Palestine provides can be allowed to delay additions and improvements which are imperative if the reputation and usefulness of the institution are not to be seriously interfered with, for it is not possible to carry out effectively the advanced up-to-date treatment of eye diseases in places which are cramped and with equipment that is inadequate. Plans have been prepared and approved to remedy these difficulties, and it has been determined, as an act of faith, to proceed with the work immediately it is felt in any way to be possible owing to the political situation, and to this end £12,500 has been subscribed, a further £10,000 being needed for its completion.

Incidence of Trachoma

Intensification of the civil disorders throughout Palestine, in which some 2,000 people were killed and more than 1,700 wounded, considerably diminished the normal flow of patients to the Ophthalmic Hospital of St. John of Jerusalem during 1938. Indeed, the eventual enforcement in November of a military order requiring the possession of an identity card and a travel pass produced for a time a virtual cessation. Nevertheless 14,115 new patients were seen during the year, while the total number of consultations was 79,019. In-patients numbered 766, and 1,814 operations were performed. The incidence of trachoma among new patients was 87.67 per cent. This formidable figure is, however, regarded as unusually low, comparing with 93.4 per cent. in 1936. The decrease in incidence during the last two years is attributable to a change in the type of patient attending the hospital. As a result of the prevailing civil strife the dense Arab populations of the numerous villages of the plains, and also of the Hebron, Nablus, and Jenin areas, have been unable to come for treatment. These Arabs are said to be almost 100 per cent. trachomatous. Their places in the out-patient department have been taken by the much less heavily infected inhabitants of the Jerusalem area. With regard to treatment of trachoma the administration of sulphonamide preparations has been followed by rapid improvement within a comparatively short period, especially in cases of mixed infection trachomas. It is thought possible that the value of this treatment may lie in the speedy eradication of the streptococcal and staphylococcal infections which accompany most cases of trachoma in Palestine, but it is pointed out that it has not yet been proved that these sulphonamide preparations have a permanent curative effect on an uncomplicated virus infection of the conjunctiva.

The report for 1938 of the Central Council for the Care of Cripples records the establishment during the year of voluntary associations in four additional counties. These associations, formed under the auspices of the Lord Nuffield Fund for Cripples, now number eleven in all. The report stresses the great and increasing need of facilities for vocational training for cripples. A misfortune in this respect was the closure during the year of the training workshops attached to the Wingfield-Morris Orthopaedic Hospital, which provided training for twenty-eight boys and young men in carpentry, boot-making and repairing, and the manufacture of surgical appliances. Handicraft classes for homebound cripples, established in several counties, have shown encouraging results, especially in Surrey and Sussex, where the local associations have been in charge since July, 1938. In these two counties hand-made toys of first-class design, material, and workmanship have found a ready market. It is proposed to register a trade mark for the toys made in Surrey, in order to ensure that only goods of the highest quality are sold as the work of the cripples. With regard to the rehabilitation of persons disabled by accidents the report mentions the provision, in the reopened Albert Dock Hospital, of a non-residential rehabilitation centre, together with a modern fracture clinic, for patients treated for injuries at that institution. This centre is the first of its kind in England.

Reports of Societies

TREATMENT OF MALARIA IN A MILITARY POPULATION

At a meeting of the United Services Section of the Royal Society of Medicine on April 17, Air Commodore H. E. WHITTINGHAM presiding, a paper was read by Lieutenant-Colonel S. SMITH on the treatment of malaria in a military population.

Colonel Smith said that his experience with anti-malarial remedies fell into three periods, corresponding with his three terms of foreign service. The first was in India from 1919 to 1924, when quinine was employed; the second again in India from 1928 to 1932, when plasmoquine was employed; and the third in Hong Kong from 1936 to 1938, when the remedies employed were atebrin, plasmoquine, and the British manufactured synthetic drug tebetren. While quinine was a first-rate therapeutic agent, especially in the acute attack, one realized its limitations so far as the relapse rate was concerned. The first year of the second period was spent at the Malaria Treatment Centre, Kasauli—since closed—when plasmoquine was "tried out" in the treatment of chronic relapsing malaria. Cases of chronic relapsing malaria were sent there from the whole of India, not actually in the state of relapse, but in the convalescent state, and came up every week for examination. Plasmoquine had a dramatic action in lowering the relapse rate, but toxic manifestations were unduly common with all but the smallest doses. The two toxic results were an unmistakable cyanosis and epigastric colic of a peculiar type. When such manifestations appeared the men were taken off plasmoquine for three or four days, and the trouble subsided; afterwards they were able to resume treatment and to complete the standard twenty-one-day course of plasmoquine and quinine, which was devised at this centre and adopted for all forms of malaria in the British Army in India. The toxic manifestations arose almost constantly between the sixth and the ninth days. The best dose was 0.04 gramme of plasmoquine and 20 grains of quinine daily.

In 1936 he went to Hong Kong. Malaria was not very serious at that station. At the time he went there only about seventy cases were recorded in a year in a garrison of some 6,000. Afterwards, largely owing to military activity consequent upon events in China, about 200 cases were met with in a year, and during the three years he was in Hong Kong he treated about 650 cases. At the outset all cases of benign tertian malaria received an eight-day course of atebrin alone, the standard atebrin–plasmoquine course being reserved for malignant tertian cases. While proving satisfactory in the treatment of the acute attack, atebrin used alone quite failed to keep the relapse rate within reasonable limits, and in consequence the combined treatment came afterwards to be used for all forms of malaria. The atebrin was given in doses of 0.3 gramme daily for six days, with two days' rest, followed by plasmoquine 0.03 gramme daily for five days. The relapse rate, which had been 37 per cent. with atebrin alone, was greatly reduced, but as his experience grew he came to realize that quite a number of cases did not react as quickly as one would have expected them to react in the old quinine days, so he decided in a small series of cases of benign tertian malaria to start with an initial two-days course of quinine preliminary to the normal atebrin–plasmoquine course, in the hope, to some extent realized, that the febrile period might thereby be cut short. In the malignant tertian group a number of anomalous cases appeared. These seemed, when first admitted, to be ordinary cases of malaria, but after three or four days they collapsed and became exceedingly grave medical emergencies. In some cases death occurred. In some of these severe cases from one to three preliminary intramuscular injections of atebrin musonate were given at daily intervals. Later this was given as a routine measure, and the results were quite satisfactory. The only other drug used was tebetren; it was used only in a small series of benign tertian cases, with promising results.

In summary it could be said that with regard to synthetic remedies atebrin was an excellent drug in many ways, with fairly rapid action in the acute attack; it was fairly non-toxic, and quite pleasant to take, but it had very little action on the relapse rate. Plasmoquine had practically no action on the acute attack, and was toxic even in small doses, and some people had an idiosyncrasy to its use, but it was absolutely necessary in preventing a high relapse rate; its action in that respect was dramatic. During his last three months at Hong Kong, when military units were being used on the territories between Hong Kong Colony and the Chinese border, where the Japanese Army was stationed, one of the battalions policing the district was placed on prophylactic quinine. From the clinical point of view this was disastrous, because a large proportion of the cases which occurred produced negative slides and went on producing them. It was ultimately decided to put them on atebrin, because it was found that atebrin, in contradistinction to quinine, had a provocative action. It sometimes produced parasites in the blood where they had not been shown before. It looked as though atebrin was of more prophylactic value than quinine.

General Discussion

Colonel F. M. LIPSCOMB sent a note on the subject relating to about 690 cases treated with synthetic drugs in the Punjab in the period 1932–8. The malaria was usually mild, both in the benign and malignant tertian varieties. The season of infection was limited to about two months, from the end of August to the end of October. The synthetic drugs used were atebrin and atebrin musonate, and plasmoquine and certuna. The majority of the patients were treated with atebrin and plasmoquine, with a four-days interval between the two parts of the course. Later the interval was reduced to two days without ill effect. The number of cases treated with certuna (sixty-one) was small. In the relapse rate there was little to choose between oral atebrin and oral quinine, and atebrin musonate intramuscularly in a small number of cases seemed as effective as intravenous quinine, and more convenient to administer.

Colonel J. S. K. BOYD said that it was his privilege from 1932 to 1936 at Simla to be in control of the malaria statistics of India. During that time atebrin–plasmoquine and quinine–plasmoquine were tried out on a large scale. The malaria year might be divided into two parts. From July to December the majority of primary cases of malaria occurred, and from January to June the cases that occurred were mainly relapses. It was thought interesting to compare the proportion of cases occurring between January and June with the number occurring between July and December of the previous year—in other words, to assess the relapses in that rough way. From 1926 to 1935 there was a progressive decline in relapse cases. In 1928 and 1929 the proportion of cases of relapse to what might be described as the primary cases (those occurring between July and December) was 31.8 per cent. Plasmoquine was brought into general use in 1933, and the percentage dropped to 16.9 by 1934–5. In 1928, 243 cases were dealt with at the Malaria Treatment Centre at Kasauli; in 1929, 248 cases; in 1931, when plasmoquine began to be used at some of the stations, 126; and in 1932 and 1933, when plasmoquine became more or less generally adopted, 63 and 51 respectively. It was then decided to close down the centre. That was first-rate evidence of the effectiveness of plasmoquine.

The President, Air Commodore H. E. WHITTINGHAM, said that following up cases of relapsing malaria in the R.A.F. which had been treated with atebrin and plasmoquine overseas it was found that 20 to 25 per cent. relapsed if watched over a period of three years. For all cases treated with quinine the relapse rate was approximately 40 per cent., with plasmoquine about 10 per cent., and with atebrin about 5 per

cent. over a three-months period. Malaria parasites very rapidly took cover in the internal organs, and for this reason it was important in treatment to drive the parasite out into the blood stream by some provocative agent, such as adrenaline or N.A.B. Apparently, from Colonel Smith's observations, atebrin acted in a similar manner. Intravenous medication provided the best means of killing off parasites during the pyrexial period, but the dose must be so regulated that it did not cause too great a reaction. It was wise to ascertain the relapse period of each case of recurrent malaria and give the appropriate medication just before the expected relapse, so as to keep the disease in check and allow the body to develop its own immunity. To control the acidosis and hypoglycaemia which occurred during acute malarial attacks, as pointed out by Sinton many years ago, alkalis and glucose should be given freely. It was not advisable to give atebrin to known alcoholics; acute jaundice developed in two such cases under his care. Those having atebrin should also be warned not to expose themselves to direct sunlight for three or four weeks after treatment. N.A.B. as a form of treatment for malaria was not generally appreciated. This drug not only drove the parasites into the circulation but was also lethal to them and was a good general tonic. Its use was recommended not in primary attacks of malaria but more for recurrent ones. N.A.B. 0.45 gramme was administered in the morning to drive parasites into the circulation and to damage a certain number, then 10 grains of fluid quinine was given at night time and 10 grains three times during the following day to complete the action against the parasites. Further injections and quinine treatment were given at weekly or fortnightly periods, depending on the relapse period, until six or eight treatments had been given. If this treatment was tried at the week-end the patient was usually fit for duty during the following week.

THE PROBLEM OF GLAUCOMA

Lecture by Professor de Grósz

Professor Emile de Grósz of Budapest, a world-renowned authority on glaucoma, lectured before the Hunterian Society, London, at the Mansion House on April 17, Mr. A. C. McAllister, president of the Society, in the chair, Professor de Grósz began with a reference to links between Hungarian and British medicine, in particular the appreciation of Semmelweis in this country, where the project of erecting a monument to the great Hungarian physician was warmly supported by the Royal College of Physicians. In his own country the names of Newton, Jenner, Harvey, and Hunter were as vivid as ever. "We Hungarians are proud of the cultural relations which connect us with Great Britain, and we are also proud that Hungarian blood flows in the veins of Her Majesty Queen Mary."

Pathogenesis Still Unsolved

The problem of glaucoma was one in which he had been interested for many years. Glaucoma took first place among causes of blindness. It caused blindness much more frequently than syphilis, tuberculosis, blennorrhoea, or even injury. This was so throughout the world, though it was true that in countries of high culture and well-being, with a well-developed public health administration, the percentage was lower than elsewhere. In England and Wales glaucoma accounted for 9 per cent. of cases of blindness. Rates of 13, 14, 15, and 17 per cent. were recorded in Holland, Switzerland, Germany, and Hungary respectively. The pathogenesis of the condition was still obscure. The hardness of the eyeball was remarked as long ago as 1626 by Banister. One of the lecturer's predecessors in the chair of ophthalmology at the Royal Hungarian University in Budapest in 1783, Professor Plenck, wrote that "glaucoma is an opacity of the vitreous body . . . a very rare disease, extremely difficult to recognize and always incurable." Another predecessor, Fabini, said in 1830: "The prognosis of glaucoma is very sad: the elasticity of the eyeball changes so that it becomes as hard as stone." In the same year Mackenzie of Glasgow called attention to the high pressure and hardness of the glaucomatous eye.

In 1856 von Graefe proposed iridectomy for the treatment of glaucoma. As Sir William Bowman said, this was not an accidental guess, but rather a thoughtful conclusion which was worked out step by step. As Hirschberg put it, iridectomy was for von Graefe what Faust had been for Goethe. Von Graefe's pronouncement was one of the most important events in the history of ophthalmology, for with his keen judgment he realized that success depended on acting in time. After his too early death, his successors seemed to forget their master's admirable self-criticism and almost discredited his discovery by their exaggerations. There were others who wanted to overthrow his teaching. But the present generation had done justice to his merits. The value of iridectomy in cases of acute glaucoma was indisputable, but in the simple and chronic inflammatory condition no good result from this procedure could be expected.

Hereditary and Other Characters

The glaucomatous eye, said Professor de Grósz, was "a sick eye in a sick body," but the nature of the connexion was by no means clear. In the words of Sir Stewart Duke-Elder: "It is probable that glaucoma is essentially a general derangement in the intimate economy of the eye, most usually of a physico-chemical nature." There was no doubt as to its hereditary character, and also that subsequent generations developed the disease at increasingly earlier ages. Thus one man became afflicted with glaucoma at 83, his daughter at 62, and her two sons at 44 and 38. In another example, the grandparents became glaucomatous at the ages of 54 and 57. Of their five children, two daughters developed glaucoma at 38 and 35, and the son of one of the women at the age of 20. Glaucoma was especially prevalent among the Jews. Of the glaucoma patients at No. 1 Ophthalmological Hospital, Budapest, 28 per cent. were Semitic people.

As director of the Eye Hospital attached to Budapest University for thirty-one years, he had had ample opportunity for studying this condition. In the course of that time there had been 4,326 in-patients with glaucoma. Only 8 per cent. of this number came to the hospital in the first week of the disease, and 13 per cent. in the first month. Among the patients 60 per cent. were women, and if the acute cases were taken the women accounted for 80 per cent. The disease usually started between the ages of 55 and 65, and the first attacks of acute glaucoma came on during the winter. As regards refraction, hypermetropia was found in 63 per cent. of the cases and myopia in 14 per cent.

Unfortunately there was a chaotic divergence of views concerning the terms used for the different forms of glaucoma as well as the indications for operation. Von Graefe claimed that iridectomy always resulted in complete recovery of vision when performed in the acute stage of congestive glaucoma within the first two weeks after the onset of the inflammatory process. During the last twenty-five years a number of operations had been recommended as alternatives to iridectomy. During his own thirty-one years of directorship, iridectomy, which at the beginning was the prevailing operation, had been carried out 2,773 times at his clinic, trephining 755 times, iridosclerotomy 168 times, and cyclodialysis 1,006 times. The results obtained by trephining were favourable, tension being reduced to normal in 83 per cent. The immediate result after cyclodialysis was favourable in 87 per cent., and the great advantage of this procedure was that it carried the least risk.

Instruction in Ophthalmology

The fact that in spite of successful methods of treatment the disease was still the cause of much blindness was due

to the indolence of patients, lack of facilities for treatment, and occasional wrong diagnosis. The lecturer described the facilities for eye treatment in Hungary, and added that at the four faculties of medicine in that country there were professorial chairs in ophthalmology, and only those persons were entitled to call themselves eye specialists who, having obtained their doctorate of medicine, had spent at least four years at a university eye hospital and passed a special examination in ophthalmology. In Hungary, moreover, ophthalmology as a subject for the general practitioner was considered on an equality with internal medicine, surgery, and gynaecology. The lectures on ophthalmology at the universities must be attended for seven and a half hours weekly, and after the curriculum was finished two months of practical work was compulsory, and every doctor had to pass a special examination in the subject. Progress in ophthalmology rendered postgraduate instruction necessary. Here he suggested that in London an ophthalmological department would be a most desirable addition to the "perfect departments" for medicine, surgery, and gynaecology at the British Postgraduate Medical School. In addition to all this, in Hungary, a certain amount of aided research was proceeding. The Council for Natural Sciences, the Széchenyi Scientific Society, and Prince Paul Esterhazy's scholarships were enabling young medical students and others to carry out research work. He was proud to mention that in research on the problem of glaucoma two of his own pupils had attained remarkable results, and two others had made valuable contributions.

In some brief observations following the lecture Sir RICHARD CRUISE said that there were two outstanding names in connexion with glaucoma. One was von Graefe, who had received a deserved tribute; the other, less well known, was Lagrange, whose method of producing the filtration of fluids from the interior to the exterior of the eyeball had been instrumental in curing very many cases of simple or chronic glaucoma, to which the method of von Graefe was not applicable. Both these men had helped to remove from the subject the unliked word "incurable." Mr. RUGG-GUNN mentioned that Professor de Grósz had worked in the same hospital for forty-eight years—seventeen years as assistant and thirty-one years as director. Both his father and grandfather were distinguished ophthalmologists, and his son, Stephen de Grósz, was following in his steps. Mr. R. C. DAVENPORT said that Professor de Grósz's reference to the British Postgraduate Medical School would be noted. The fact that in England there was no chair of ophthalmology (it was not quite true of Great Britain, for there was a chair at Glasgow) was certainly to be deplored.

THE PSYCHOLOGY OF RESTLESSNESS

At a meeting of the Medical Society of Individual Psychology on April 13, Dr. A. SANDISON read a paper on "Escape into Activities." Dr. H. C. SQUIRES was in the chair.

Dr. Sandison said that in animals activity was primarily concerned with preservation of self and race, supplemented by the exercise necessary for health, and beyond these needs the animal did not indulge in excess of activity. The greater activity in the smaller animals was associated with their more rapid loss of heat and the need for constant supply of food. In man, he suggested, the natural causes of activity were fundamentally the same, but extended into wider spheres of self-fulfilment and mental creation. In so far as man's activity could be related to such objects it was normal; otherwise it was in need of further explanation. It was, however, very difficult to define a normal range for man's activities, since individuals varied so widely in their capacity and circumstances. An attempt to define normality by the nature of the activity was apt to lead to confusion. A quantitative standard, by the amount of activity, was a better guide. We did not know what a man might do, but we did know more accurately how much, for there were minimum and maximum limits to capacity for energy and exertion, physical or mental. The proper spacing of rest periods was a function of life, and when activities were pursued in a way that hindered adequate rest and repose we could suspect abnormal circumstances, which might or might not be psychological.

The causes of activity were stimuli; successful living consisted in sorting out the stimuli and dealing with them according to their importance. When this selection of stimuli became uncoordinated we lost balance, and our engine was apt to race or stall. When the ordinarily well-controlled person broke out into a profusion of activities the explanation might be pathological or physiological, but not infrequently was psychological. Could it ever be a manifestation of a desire to escape from real or imagined fears or discomfort? The escape motive had become rather too fashionable, but it was noteworthy that activity was a biological method of escape. Flight and combat both involved strenuous exertion, and the sudden transition from paralysing fear to violent anger was an attempt to escape by a quantitative increase in activity. Might it not be that this association in animals between escape and increased activities had extended itself in man to the mental sphere? A normal association between activity and escape seemed reasonably established, and when the stresses from which escape was sought increased in number or in intensity we might react by multiplication of activity into activities. The process might be conscious and deliberate, or, more often probably, the seeking refuge in an accumulation of miscellaneous activities was subconsciously determined and not readily or willingly understood.

Dr. Sandison concluded that escape by activity was a normal physical and psychological phenomenon, and that its quantitative increase into activities might be a reasonable form of self-therapy. Its therapeutic value and normality could be judged by the extent to which it controlled and diminished the restlessness it sought to remedy.

PROTECTION AGAINST INDUSTRIAL DISEASE

A meeting of the University Labour Club on April 13 was addressed by Dr. DONALD HUNTER, his subject being, "Is Protection against Industrial Disease Up to Date?"

Dr. Hunter concluded that in the main it was not. He pointed out that in many respects this country was far ahead of other countries, such as Germany and the U.S.A., where legislation was either inadequate or inefficiently carried out. The extent of the problem was well shown in the Rand gold mines, where out of a total wage-bill of £14,000,000 no less than £1,000,000 was paid in compensation to widows and orphans of the victims of silicosis. The past forty years had witnessed a tremendous improvement, but much remained to be done. The horrors of the early stage of industrialization had largely disappeared and the legislation was fairly thoroughly carried out. He quoted the abolition of wool-sorters' disease as one of the best examples of this. Equipment, however, was not standard. Dry tool-grinding had been almost abolished, but the methods of washing away silica particles were not always effective. Further, the safety apparatus was often under the workman's control, and could be put out of action by him. This was most undesirable.

Much improvement could result from the use of newer and better methods. The increasing use of mechanical devices often avoided the exposure of the workman to dangerous substances incidental to manual processes; often, too, safe alternatives were available. Thus carborundum wheels were quite harmless and could well replace dangerous sandstone wheels, which often needed "rodding" or smoothing—a highly dangerous process. Here one came up against prejudiced conservatism which always

preferred an old method to a new one. In smaller, less well-organized, and old-established industries conditions were often still bad. Education of the workers and foremen was most essential, as without their intelligent co-operation little could be achieved. Misguided enthusiasm might do more harm than good, as in the case of the man who blew the asbestos dust off the girders in the workshop with a vacuum cleaner! Diagnosis of industrial diseases was complicated by the fact that modern methods often involved a number of separate processes, one of which might be to blame. Thus a rubber worker might get lead poisoning in the course of his work, as lead was used to treat the rubber. Another difficulty was that all medical practitioners might not be familiar with the manifestations of industrial disease.

Dr. Hunter then discussed the introduction of new substances into industry. He stated the case for State control and for State research. By this means alone, in his view, could useful knowledge be pooled and ghastly mistakes, such as that which had occurred in the asbestos trade, be avoided. He showed a film illustrating a case of extreme posterior column degeneration due to mercury methyl acetate, a fungicide used to protect wheat and oats from infection. A number of such cases had occurred, though relatively harmless substitutes had already been evolved by I.C.I. and A.G. Farbenindustrie. Had these investigations been carried out by the State this disaster could never have happened, as the knowledge would have been pooled and then disseminated throughout the industry. Another example of the use of a harmless substitute could be found in the felt industry. In the U.S.S.R. the use of mercury for felting had been abolished, but in Northern Italy many cases of mercurial poisoning—tremor and mania—were still to be found. State research could use animals instead of men as experimental subjects. It could keep up a steady effort to better conditions instead of the sporadic attempts of voluntary workers.

Local News

ENGLAND AND WALES

Consultant Advisers on the Organization of Hospitals in War-time

On the nomination of the Presidents of the Royal Colleges of Physicians and of Surgeons the Minister of Health has appointed the following to advise him as to the policy to be adopted in England and Wales on various matters arising within the specialties indicated: W. Kelsey Fry, *M.C.*, M.R.C.S., L.D.S., dental surgery, with special reference to jaw injuries; H. A. T. Fairbank, D.S.O., O.B.E., F.R.C.S., orthopaedic surgery.

Hospitals Day, 1939

The combined hospitals flag days in London for 1938 produced £44,214, representing an increase of nearly £19,000 on the total annual income which the hospitals concerned used to collect on their individual flag day. While the special hospitals are to collect in October, the general hospitals will make their collection this year on Tuesday, May 9, in inner London and on Saturday, May 13, in the outlying areas. Lord Luke, chairman of the London Hospitals Street Collections, has been authorized by a generous benefactor to announce that he is willing to give a bonus of one-half more than the total collected in the streets during the May hospital flag days—that is to say, that a shilling given in the streets during those days will become 1s. 6d. The London Passenger Transport Board has placed at the committee's disposal part of the underground station at Charing Cross for a hospital exhibition; this is to be opened on May 8 by Lord Luke, and besides giving an impetus to Hospitals Day should help in calling attention to the work of the voluntary hospitals in London as a whole. The exhibition will last until about the end of May.

London Health Services

The establishment of a combined hospitals and school dental service under the auspices of the L.C.C. on a permanent full-time basis has been approved. It will result at present in the employment of sixty-two full-time dental surgeons, but it is intended to substitute these full-time positions for the existing part-time ones only as opportunity offers. The scale of salary to be attached to the new positions will be £500, rising by increments of £25 a year to £750. Marriage is not a bar to the present employment of women part-time dental surgeons, nor will it be a bar to employment in the full-time positions.

In 1936 the L.C.C. approved the employment of part-time assistant medical officers on a sessional basis for the ante-natal clinics at certain general hospitals. The arrangement was for an experimental period of one year, and was subsequently extended. The value of the work of these part-time assistant medical officers has been fully demonstrated, and the arrangement is now to be made permanent. The remuneration will be £90 a year for one session of approximately two and a half hours a week for fifty-two weeks a year, and at the rate of £65 a year for each additional session.

The existing arrangements for the diagnosis and treatment of venereal diseases in the county of London, in which the councils of six adjoining counties and three county boroughs participate, are to be continued during 1939–40. The number of new cases coming to the clinics in 1938 was 25,897; of this number more than half were found to be not infected; the number of venereal cases treated was 12,379, a decline of some 700 on the year. The number of cases of syphilis was 2,864, of gonorrhoea 9,271, and of soft chancre 244, but it is pointed out that these figures do not fully indicate the extent to which venereal diseases come under treatment in London, as a not inconsiderable number of cases receive treatment by private medical practitioners.

The London County Council has reviewed the salaries and provisional allowances of district medical officers. The number of persons seen by part-time district and assistant district medical officers during 1938 was 50,072, the number of attendances at surgeries and medical relief stations was 184,187, and the number of domiciliary visits 63,850, each of these figures representing a slight increase on the previous year. On the basis of the amount of work carried out during the past year it is proposed to increase the salary of thirteen assistant district medical officers, and to reduce that of three others. The salary in these cases includes the allowance in certain instances for the use of surgery. In four other cases in which the salary was fixed by the late authority the allowance is to be reduced.

SCOTLAND

Neurosurgical Unit in Edinburgh

Ward 20 in the Edinburgh Royal Infirmary was opened recently as a neurosurgical unit by Lady Grant, widow of the late Sir Alexander Grant, who had provided funds for this purpose. Mr. Norman M. Dott, associate neurological surgeon to the infirmary, who is in charge of the ward, thanked Lady Grant and also the Rockefeller Foundation, who had supplied part of the equipment. The ward will provide both for the sick poor suffering from neurological conditions requiring operations, and also for those who are able to pay but who require attention by a specially trained staff and special equipment, which could only be made available in a large central institution.

Edinburgh Orthopaedic Clinic

At the annual meeting of the Edinburgh Orthopaedic Clinic on April 10 Miss Gertrude Herzfeld, F.R.C.S., stated that the clinic had purchased new premises at 26, Gilmore Place, which were being reconditioned and would be ready for occupation by the end of May. The annual report of the clinic shows that 693 patients were treated during the past year and 11,114 treatments given ; in the home treatments section 931 visits were paid and forty patients from the Princess Margaret Rose Hospital for Crippled Children received after-care. The expenditure for the year was £1,317 and income £1,082. The capital of the clinic has nearly all been absorbed by the purchase, reconstruction, and equipment of the new premises. It is pointed out that the clinic is staffed entirely by members of the Chartered Society of Massage and Medical Gymnastics, and that all treatment is undertaken under the supervision of the clinic's honorary surgeons.

Glasgow Royal Samaritan Hospital

At the recent annual meeting of the Royal Samaritan Hospital for Women, Glasgow, a proposal was submitted for the erection of a new maternity block at a cost of £80,000, which, it was stated, was now necessary in the general health work of the city. Lord Rowallan said it had been discussed whether the new part of the hospital should be erected on the present site, but if this were not done there would be duplication of many services and extra expense. Additional accommodation for the nursing staff was required in the existing building in order to reduce working hours. The new block would be devoted entirely to maternity cases and would leave part of the present hospital for ante-natal work.

INDIA

Institute for Medical Research

An account of useful investigations is contained in the third annual report of the Indian Institute for Medical Research, Calcutta, which relates to the year 1937–8. An attempt was made to corroborate the researches reported by Dr. Dora Colebrook in 1935 on the close group relation between haemolytic streptococci of the nose and throat and those concerned in puerperal infection, but as the result of investigating 790 maternity cases in Calcutta hospitals, in which puerperal fever was present in only forty-four, it was found that the percentage of haemolytic streptococci in the throat was very small, the source of infection not being the actual patient but probably some outside source, possibly contacts. Further encouraging results attended the use of antityphoid serum prepared by increasing the amount of *B. typhosus* in highly alkalinized broth cultures. In a small epidemic in Bombay during the year the serum was shown to diminish the toxaemia very quickly, the temperature falling to normal and remaining so within two to five days after the administration of the serum. The best results occurred in cases in which treatment was begun early in the disease. The serum was prepared from one strain of *B. typhosus*. One patient, with extreme toxaemia and coma, died in spite of treatment. The blood culture and Widal test proved negative on the eighth day, though clinically it was a typical case of typhoid fever when the serum was administered. This failure suggested the advisability of using more than one strain of *B. typhosus* (including the Vi strain) for the production of toxin. Peptic peptone and tryptic peptone for the preparation of the broth seemed to have no influence on the quality of the toxin, though the filtrate obtained after digesting an agar culture of *B. typhosus* with trypsin proved to be highly toxic. The association of other organisms, such as *B. coli*, the enterococcus, and micro-organisms of dysentery and paradysentery groups, with *B. typhosus* seemed to cause definite activation of the typhoid organism ; this line of investigation is being continued. In an attempt to simplify the serum treatment of cholera in highly toxaemic cases the following procedure was tried with most satisfactory results. After the preliminary saline transfusion one single injection of 75 c.cm. of the Institute's serum diluted with 200 c.cm. of slightly warm saline solution was given intraperitoneally, and with the exception of intravenous glucose and strychnine and atropine injections no other saline transfusion or medicament was given. Cases of threatening or actual oedema of the lungs yielded to transfusion with saline solution and castor oil. The best stimulant in cholera was found to be a mixture of strychnine and atropine. The importance of associating secondary micro-organisms with *V. cholerae* was shown by several workers ; it was also observed that cholera-like diarrhoea could be induced in rabbits by injecting a filtrate of a broth culture of *V. cholerae* followed by the injection of a broth culture of associated intestinal micro-organisms. It was also shown that *B. pyocyaneus* infection could produce symptoms closely resembling cholera and dysentery. Leishmania parasites have been successfully grown on solid media, thus providing sufficient quantities of pure cultures for immunological investigations, which have indicated that the mechanism of antibody production and the conferring of immunity are essentially similar in bacterial and protozoal infections. This most promising line of research is being pushed rapidly, because two rhesus monkeys proved immune to malaria infection after having been given heavy doses of parasites.

Tuberculosis in Bombay

Although in the year 1937–8 the health of the City of Bombay as a whole was highly satisfactory, and the birth rate increased, it is clear from the statements by the Municipal Commissioner and by the Executive Health Officer that tuberculosis is still increasing, and that there must be approximately 20,000 cases in the city. Still more active efforts to stem the advance of the disease are therefore necessary, and it is regretted that the establishment of a " preventorium " for the bringing up of children of tuberculous patients as well as of children in the earliest stages of the disease, and also of a colony for those who have been successfully treated, cannot be contemplated at present on account of its cost. The anti-tuberculosis campaign is controlled by the Public Health Department. There are four clinics, two of which were opened in 1937. The Turner Sanatorium at Parel has forty beds for early cases of pulmonary tuberculosis, and additional accommodation to provide another forty beds is being arranged, all to be devoted to the treatment of early cases. The Maratha Hospital in Connaught Road contains eighty beds for advanced cases, and is being replaced by a larger building near the Turner Sanatorium which will accommodate 100 advanced cases. Patients are received for treatment on the notification of their own medical practitioners or of the public health medical officers, and a list of notified cases is issued from time to time. Contact cases are systematically examined, radiology being used as well as the ordinary clinical methods. In 1937 the nurses paid 3,643 primary and follow-up domiciliary visits ; special records are kept to ensure the advice given being taken, and the campaign proceeds continuously. Propaganda work is being pushed energetically, and there are more and more signs of the awakening in the community of interest and a sense of responsibility. There was no case of plague in 1937, but small-pox was epidemic at the end of the year, with a low mortality. Revaccination cannot be enforced under the present provisions of the Bombay Vaccination Act of 1877, but amendments to make it compulsory for children under the age of 14 are under consideration.

Correspondence

Frequency of Blood Donation

SIR,—My attention has been called by several of the London donors to what appears to be an authoritative medical statement in the April issue of *The Scouter*—the official publication of the Boy Scouts' Association—on the frequency of blood donation by Rover scouts. It reports that the unanimous opinion of the staff of the General Infirmary at Leeds is that "to give blood more than once in six months is harmful to the individual and not of the maximum help to the patient." In these days when volunteering for blood donation in a time of emergency may be required on a large scale and constitute a form of national service, I feel that such a statement should not pass unchallenged, as it is entirely contrary to experience, both in this country and abroad, and may be a serious deterrent to the recruitment of donors.

The present strength of the London Blood Transfusion Service is 2,698 donors, and, of these, 630 are Rover scouts (the youngest age limit of acceptance is 18 years). The established minimum safe interval between donations is three months for males and four months for females, and the majority of the donors give blood at these intervals. Such frequency has, in my experience of eight years' medical supervision of the London Service, in no way impaired health and does in fact provide a margin of safety. Periodic haemoglobin estimations on individual donors after bleedings of the usual volumes (400 to 750 c.cm.) show a constant return to a normal figure within two months.

Since the end of 1931 to the present date 1,076 members of the Service—all of whom have given blood on ten, or multiples of ten, occasions (a few up to fifty) at such intervals—have been examined, and these include nearly 300 Rover scouts. Examination has been carried out at less than three months after the last bleeding. The information so obtained has shown conclusively that such frequency in no way impairs health or causes any degree of anaemia.—I am, etc.,

H. F. BREWER, M.D.,
Medical Officer to the British Red Cross Society
London Blood Transfusion Service.

St. Bartholomew's Hospital, E.C., April 19.

"Medical Testament" on Nutrition

SIR,—The "Medical Testament" of the thirty-one members of the Cheshire Panel Committee (*Supplement*, April 15, p. 157) is to me a most welcome document. To the best of my knowledge it is the first testament of a body of medical practitioners on the vital importance of considering the associated healths of soil, vegetable, animal, and man, which I also ventured to advocate in the *Journal* of February 11 (p. 276). The "Medical Testament" points out the anomaly, which is becoming widely recognized, that though in the treatment and cure of disease our profession has achieved much as measured by the prolongation of life, yet the bulk of sickness has definitely increased. The cause of this baffling of medical effort by which, to quote from the "Testament," "probably half our work is wasted," the thirty-one practitioners find in the defective character and defective cultivation of the food which the people eat. "Nutrition and the quality of food," they state, "are the paramount factors in fitness. No health campaign can succeed unless the materials of which the bodies are built are sound. At present they are not."

In the penultimate paragraph of the "Testament" the writers declare that they consider the opinion resulting from their study of the subject, the scope of which is given in the references which accompany the "Testament," is "so important that this document is drawn up in an endeavour to express it and make it public." May I, therefore, be excused if, for similar reasons, I ask you to permit me to refer to the evidence upon the same subject which I made public in my book *The Wheel of Health*, which was reviewed in your issue of October 8, 1938 (p. 746). Long ago I put to myself the question, "What is health?" and in endeavouring to find an answer I studied, so far as my limited opportunities permitted, the healthiest peoples I could find. This led me to a particular study of the natives of the State of Hunza on the north-western border of India, of whom Sir Robert McCarrison wrote: "These people are unsurpassed by any Indian race in perfection of physique; they are long-lived, vigorous in youth and age, capable of great endurance, and enjoy a remarkable freedom from disease in general."

The answer that emerged from the information I acquired of the Hunza and some other very healthy peoples was that human health is not a separate entity, but part of a cycle of healthy soil, healthy plant, healthy animal and man. The Hunza employ a scrupulous and wonderful agriculture, which is probably one of extreme antiquity, and which may be summed up under the phrase "the rule of return." They carefully collect, compost, and return after use everything that has once taken life from the soil to the soil for its food, and they return to their levelled fields the small amount of top-soil that is lost through wind and water. The wheel of life is preserved in its entirety: there is neither waste nor loss, and the result is a wholeness of the life-cycle or health. To the originating factor of the healthy soil must be added that of the sea. The sea is the great secondary "soil" of the world, and one less subject to man's interference. It forms an originating factor in the wheels of health enjoyed by the Polar Eskimos, and the inhabitants of Tristan da Cunha and other islands, if insulated from the currents of progress. The definition of human health as a part of a cycle, of which the healths of the soil, sea, plant, and animal are the other parts, cannot as yet be regarded as proven. But the "Testament" voices what many of us feel—namely, that the relation of agriculture and quality of food to human health is a paramount practical consideration for the medical profession, if it is to add to the sum of its triumphs over disease its alliance in a possible future totality of health.—I am, etc.,

Caversham, April 17. G. T. WRENCH, M.D.

SIR,—May I crave the hospitality of your correspondence columns to emphasize the importance of the "Medical Testament" made public by the Cheshire Panel Committee at a meeting on March 22. The committee is to be congratulated on its initiative in holding the meeting and producing such an important and remarkable document supported by the authority and presence of such men as Sir Robert McCarrison and Sir Albert Howard.

The "Testament" points out that the National Health Insurance Act has failed in its most important object—the prevention as opposed to the cure of sickness. It demonstrates convincingly and clearly the defect and the remedy, showing how the faulty national dietary is the basis of ill-health, and our efforts at public health fruitless

until we realize that "no health campaign can succeed unless the materials of which the bodies are built are sound." Its final words are impressive, and I cannot do better than quote them: "We cannot do more than point to the means of health. Their production and supply are not our function. We are called upon to cure sickness. We conceive it to be our duty in the present state of knowledge to point out that much, perhaps most, of this sickness is preventable and would be prevented by the right feeding of our people. We consider this opinion so important that this document is drawn up in an endeavour to express it and to make it public."

In my opinion this is one of the most important statements ever produced by the profession, but, admirable as it is, I fear it will pass unheeded unless it is supported vigorously by the profession as a whole. Is it not possible for the "Medical Testament" to be adopted and approved generally by other panel committees, by local Branches of the British Medical Association, and by the Association itself at the Annual Meeting? We should use every means in our power to inform public opinion in this matter, and to influence the Ministry of Health and the Government to adopt a policy in keeping with these fundamental truths.—I am, etc.,

ERIC TOWNSEND, M.D., Ch.B., D.P.H.

Bournemouth, April 23.

Anaesthesia in War-time

SIR,—Several articles have recently been published on the subject of war wounds and their treatment, but so far nothing has been said about anaesthesia in war-time. It must be realized that to produce an efficient anaesthetic service the question must be dealt with from three aspects, the first being the clearing zone, the second the evacuation zone, and the third the base hospital and at sea; there is also the main hospital situated well away from the firing line but vulnerable to attack from the air. To combine efficiency with safety, simplicity must be the keynote of anaesthetic technique. Medical officers should be conversant with the drugs that are likely to be used, and a simple kit of apparatus is required which is light and portable and can be dismantled quickly if necessary. It is not proposed to deal with the different types of administrations that can be given in the main hospitals, but to give a survey of the needs and limitations of anaesthesia for emergency cases under difficult circumstances.

Let us first take the clearing and evacuation zones. There is no doubt that intravenous anaesthesia is the best type of anaesthesia in an emergency, because the apparatus is light and easy to carry about and therefore lends itself to use in war. A suitably shaped case for the medical officer should contain 10-c.cm. and 5-c.cm. syringes with size 14 needles, which should be sterilized beforehand or carried in a case which keeps them sterile; also a reasonable number of ampoules of an intravenous drug with sterile distilled water; and, if possible, a small flask of methylated spirits. In addition, another small case could be worn containing lint, bandages, emergency props, tongue forceps, etc., together with emergency drugs such as morphine, coramine, and omnopon and scopolamine. So far as possible these drugs should be in tablet form. Small doses of 3 c.cm. or 4 c.cm. pentothal will enable an acute haemorrhage to be stopped or a gaping wound to be plugged without upsetting the patient any more than necessary. It is, of course, very desirable to point out that skilled administrators should give all types of anaesthetics, and so long as small doses at a time are given intravenous anaesthesia is as safe as any other type in use to-day. So far as one can see the only disadvantage of intravenous anaesthesia in war-time is that the syringes and ampoules may get smashed, but a case lined with shock-proof material such as sorbo rubber should get over this difficulty. On the other hand, if an inhalation anaesthetic is to be used it means that ether, chloroform, and ethyl chloride, with the necessary masks, apparatus, etc., will have to be kept in the clearing stations and evacuation zone. In addition, the administration of inhalational anaesthetics takes time, and may result in chest symptoms.

At the base hospital, and also at sea, again the keynote should be simplicity. Any equipment for use in the base area should be portable and easily dismantled, as should the means of giving intravenous saline and glucose. A modernized apparatus capable of standing up to considerable manhandling and wear and tear should be evolved, similar to Boyle's apparatus, which was standardized and made suitable for the use of all grades of anaesthetists during the last war. Such types of apparatus as the McKesson, Boyle, and Walton are easy to manipulate. Those that can be made of metal and have parts which are easily replaceable should be used.

The main hospital, situated well away from the front line but not necessarily out of the range of long-distance bombers, would have the same type of apparatus as in peace-time. It is not necessary to go into details here, but there is one point which should be raised, and that is the type of apparatus suitable for the administration of anaesthetics to gas casualties. So far as is known there are no contraindications to the use of intravenous anaesthesia in gas cases. It is recognized that people suffering from some form of gas poisoning need all the air and space that they can get. Therefore oxygen chambers and resuscitation apparatus similar to that used on American fire engines and ambulance cars should be part of the equipment kept in these main hospitals, and also at the base hospitals if a portable type can be designed. There are many different types of such apparatus in existence, but the Americans have standardized one, and probably something on the same lines could be devised in this country which could be as easily turned out as the multiple car of to-day.

It is most essential that anaesthetics should be administered by experts and people who have had a thorough postgraduate training in this subject. During the last war it was noticed that chloroform anaesthesia was unsuitable for persons suffering from wound shock. It was the favourite anaesthetic of the uninitiated, being portable and easy to administer, but under chloroform, or chloroform and ether, the mortality from amputations through the upper half of the thigh was over 90 per cent. in the clearing stations. Mortality under gas-and-oxygen was reduced to less than half this figure. As in civil life, the employment of skilled men wherever possible results in lowered mortality, and with the anaesthetics that we have at our command to-day it should be possible to perform emergency operations in the front line with the minimum amount of shock to the injured person.

The drugs that should be used must necessarily be those which can be manufactured in this country, and this applies especially to the barbiturates, morphine derivatives, and also to the cardiac stimulants. Ether, chloroform, ethyl chloride, vinyl ether, etc., can be obtained if necessary, but the simplest and safest type of anaesthetic should always be used, and that is gas-and-oxygen, with the addition of ether if necessary.

I strongly urge: (1) the provision of a standardized portable anaesthetist's kit for use in the field; (2) that apparatus at the base hospitals should be easy to dismantle and should be packed in well-lined cases, as they are liable to be thrown about on lorries during a hasty evacuation; (3) in times of emergency the field of anaesthetic apparatus should be narrowed down to, at the most, four uniform designs; (4) anaesthesia for persons suffering from gas poisoning is a serious problem which has to be dealt with.—I am, etc.,

London, W.1, April 3. RONALD JARMAN.

Gas Masks in the Operating Theatre

SIR,—Have surgeons considered the possibility of wearing gas masks during an actual operation? Yesterday, at the War Memorial Hospital, Rhyl, I endeavoured to do this. I planned a "full dress" rehearsal with the entire theatre staff wearing gas masks, but gave up this idea and wore the mask alone during an operation—a selected case, a disarticulation at the cubo-metatarsal joint. The moment I donned the mask I was confronted with a whole series of problems, which must be tackled and solved. The coarser part of the operation—that is, the disarticulation—was accomplished; but when it came to the finer points of the operation I was compelled to discard the gas mask in fairness to the patient. Using one's imagination to a certain extent, the difficulties came under four headings: (1) the patient; (2) the anaesthetist and his difficulties; (3) the surgeon; (4) the apparatus, which is entirely unsuited for this work. If nothing has been done so far in anticipation of such an event I suggest that the Royal College of Surgeons and the Association of Anaesthetists should call a committee of surgeons and anaesthetists to discuss this problem at the earliest moment, so that other surgeons may have guidance in this highly probable contingency. Hospitals with operating theatres on ground level will be particularly concerned.—I am, etc.,

J. S. ROWLANDS, M.D., F.R.C.S.

Rhyl, N. Wales, April 16.

*** Mr. Rowlands has raised some difficult questions. If it were possible for the surgeon and his assistants to operate in gas masks on a patient wearing a gas mask the choice of anaesthetic would obviously be limited.—ED., *B.M.J.*

A.R.P. First-aid Posts

SIR,—I am grateful to you for publishing Colonel J. M. Weddell's lecture on war wounds (April 15, p. 785) and the promise of more on the same subject. I wonder if you would consider it possible to give us some information about the organization of first-aid posts under A.R.P. During the September crisis a local emergency meeting of the B.M.A. appointed two dozen general practitioners, myself one of them, to first-aid posts which were to be established in some of the local schools. We were told to take our own emergency bags and carry on as best we could. In the seven months which have since elapsed nothing has been done by way of practice, nor have I been given any instructions on my duties. I served as an infantry subaltern in the last war, and have no knowledge of the organization of aid posts; but my experience taught me that all the operations of war need to be carefully rehearsed if one is to avoid what the sergeants used to call "a complete box-up."

I should like to ask the following questions, which I cannot get answered locally. What stores shall I find at the aid post? What sterilizing arrangements? Shall I have to give anaesthetics or transfusions of gum saline, and if so who will provide the materials? In the event of fire or damage to the aid post, who is in command to decide whether to evacuate it—the medical officer, an air raid warden, or the police? I am given to understand that the local authorities are doing all and more than is humanly possible to get A.R.P. into working order, that they cannot get enough recruits, and that inquisitive people like me merely delay things. But as no instructions have been given, and the international outlook grows grimmer, I cannot help feeling a bit uneasy, especially as I am unable to slip out of my civilian responsibilities by joining the Territorials, since I am told I am fourteen years too old.—I am, etc.,

April 18. "FORTY-SIX."

Emergency Tracheotomy

SIR,—I was particularly interested in Colonel Weddell's statement in his article in the *Journal* of April 15 (p. 785) that "emergency tracheotomy in dressing stations has been much employed by Japanese surgeons . . . and is spoken of as a life-saving measure. They have a special emergency tracheotomy appliance."

Is there any description of this appliance available in this country? If so, could it not be reproduced in the *Journal* at the earliest possible moment? Do our armed forces consider its adoption at once, in view of a state of emergency? And could it be made available for first-aid posts in this country?—I am, etc.,

W. F. FEDDEN, M.S., F.R.C.S.

London, S.W.15, April 19.

Surgical Treatment of Thyrotoxicosis

SIR,—I was particularly pleased to read the well-balanced article on this subject by Dr. J. W. Linnell and Mr. Geoffrey Keynes in the *Journal* of April 15 (p. 764). I was impressed by the statement "that many patients suffering from thyrotoxicosis have a fundamentally unstable nervous system and mentality, and naturally this cannot be changed by thyroidectomy." Many years ago I published a paper[1] on early Graves's disease in this *Journal* and expressed the view that in certain types of thyrotoxicosis the increased sympatheticotonicity which is encountered in this condition is the cause and not the result of thyrotoxicosis. This view would now seem to be vindicated.

Furthermore, Linnell and Keynes stress the importance of the menopause, and this again bears out my work on the subject[2 3 4 5]—namely, that certain women at the menopause show a relative hyperthyroidism: that is to say, they show an increased sensitiveness to their own adrenaline.

Clearly this type is due to a disturbance of the ovarian–pituitary–thyroid–suprarenal chain and responds better to substitution therapy by active substances such as stilboestrol than to thyroidectomy.—I am, etc.,

Southport, April 17. JOHN H. HANNAN, M.D.

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[1] *British Medical Journal*, 1929, **2**, 848.
[2] *The Flushings of the Menopause*. Baillière, Tindall and Cox. London, 1927.
[3] *British Medical Journal*, 1927, **2**, 14.
[4] *Endocrinol.*, 1928, **12**, 59, 64.
[5] *Practitioner*, 1927, **119**, 261.

Tuberculosis and Milk

SIR,—Dr. Hamilton F. Moffit (*Journal*, April 22, p. 843), quoting the Parliamentary Secretary to the Board of Education, asks whether when pasteurized milk is not available it is better to promote general nutrition by the free use of unsafe milk even though this means some risk of immediate infection, or, alternatively, to avoid this risk by refusing non-pasteurized milk although such refusal may mean some degree of prejudice to the general nutrition.

Presented to an anxious parent this issue may well prove embarrassing. There is, however, no need for the debate, as both safety and nutritive value can be secured by insisting that all non-pasteurized milk should be raised to boiling point prior to its use.—I am, etc.,

People's League of Health, W.1, April 25. C. O. HAWTHORNE.

Gonococcal Proctitis Treated with M & B 693

SIR,—I have read with interest the report of Dr. E. T. Renbom on this case (*Journal*, April 8, p. 749). Two statements made by him appear to me to require correction. First, I presume that the other male had had rectal intercourse with the patient, and not as stated. Secondly, I feel that his statement that treatment appears to be better when the commencement of chemotherapy is delayed for more than one week is incorrect and completely misleading. It is surely a very sweeping statement to make when the results of treatment apply to one case only. I need only refer Dr. Renbom to results published by Lloyd *et al.*, Batchelor *et al.*, MacGregor-Robertson, Bowie, and myself, covering a large number of cases which show conclusively that delay in commencing treatment with M & B 693 is most undesirable. In the case of treatment with drugs of the sulphanilamide group, on the other hand, the general consensus of opinion seems to favour delay for a week or ten days.—I am, etc.,

Liverpool, April 13. ERNEST E. PREBBLE, M.D.

Three-phase Modified Bendien Reaction

SIR,—The remarks of your correspondents Dr. Harry Coke (March 25, p. 644) and Dr. E. Cronin Lowe (April 8, p. 750) with regard to my recent paper upon the three-phase Bendien reaction have been of much interest to me. My own investigations were entirely concerned with the value of this test in its relationship to the diagnosis and treatment of cancer, in which condition I found it quite unreliable and of no clinical significance. Dr. Harry Coke's work upon the "differential sedimentation test" is well known and is a much larger contribution to medical knowledge than my own. He has well shown the intricate mechanism of the test, and has produced extensive clinical evidence to support its application to the study of arthritis. He has also demonstrated that the test is an index of certain changes that occur in blood serum under certain pathological conditions. It seems to me, however, that we are still far from understanding the actual causation and significance of these changes, although much valuable work has undoubtedly been done. I still feel, therefore, that in the field of cancer the three-phase Bendien test rests upon no secure biochemical foundation.

The great majority of my specimens of serum were taken from patients who had not been exposed to any form of radiation for a period of six months to one year previous to the performance of the test. Of the patients undergoing treatment the greater number were given at least an interval of one week between radiation treatment and collection of a specimen of blood for examination. I would not care to express an opinion on the effects of radiotherapy upon the results of the test without first making a complete examination of all available clinical records. I should like to confirm Dr. Coke's revelation of the simple part played by the flocculating colloid vanadic acid. There are quite a number of other chemicals that can be used for this purpose.

Dr. E. Cronin Lowe's conception of "mitotic allergy" is in itself a fascinating idea, and would seem to suggest that at some future date it may be possible to diagnose cancer by means of a skin test with specific nuclear proteins. The amount of effort that has been expended by many investigators—in particular the originator—on this three-phase test certainly merited a more satisfactory result.—I am, etc.,

Bristol, April 17. C. H. G. PRICE.

Bronchography without Cocaine

SIR,—I was interested in Dr. Eric C. O. Jewesbury's article in the *Journal* of April 15 (p. 772) advocating bronchography without cocaine.

Since January, 1930, I have always used the crico-thyroid method for bronchography without using cocaine. The sudden and often violent disturbance caused by rapid injection of cocaine solution through the crico-thyroid membrane seemed to me an altogether unnecessary and objectionable complication of an otherwise very simple method, and in January, 1930, in a cocaine-sensitive subject, I was emboldened to attempt bronchography without previous injection of cocaine. I found, as I suspected, that the injection of lipiodol caused neither irritation nor coughing, and the absence of sudden reaction from cocaine injection was an immense gain to the patient. Since that time, therefore, I have given up the use of cocaine entirely, and have not regretted it. The only anaesthetic used is the small quantity of novocain injected over the crico-thyroid membrane, without penetrating it. The lipiodol syringe needle puncture through the membrane is not disturbing or painful, and the warm oil, run slowly through it, causes no reaction. I cannot imagine a more simple or less disturbing procedure, and it is obvious that anaesthetization of the trachea is quite unnecessary.

I have a great admiration for the ease with which some experts decant lipiodol direct through the nose into the bronchi after very thorough and repeated cocainization of nose and trachea, but I prefer not to risk any trouble from cocaine, since the crico-thyroid method without cocaine is so very free from disturbance to the patient.—I am, etc.,

WILLIAM TEMPLETON,
Medical Superintendent, West Sussex County Sanatorium.

Chichester, April 17.

Mumps Complicating Chronic Pancreatitis?

SIR,—In your issue of April 15 (p. 774) a case is reported by Dr. A. Wilson Russell which calls for some comment. It appears that an elderly patient suffering from obstruction of the common bile duct, due to a small adenocarcinoma, was admitted to hospital, that six days before her death one parotid gland became swollen, and that a similar condition appeared on the opposite side on the following day. It is stated that this was associated with a stomatitis and injection of Stenson's duct orifices. A post-mortem examination was done, but no note appears as to the condition of the parotid glands. On

this evidence it is suggested that the patient may have been suffering from mumps.

It is true that suppurative parotitis is becoming a rare complication of abdominal operation or of prolonged illness, largely as a result of the efficient mouth hygiene now practised in hospital; but this is no excuse for a want of knowledge of its existence. All clinicians of any experience must have seen it at some time and it is described in all the standard textbooks. There can be no doubt that this condition was present and that the diagnosis of mumps has nothing to recommend it.—I am, etc.,

Leeds, April 18. DIGBY CHAMBERLAIN.

Psychogenesis of Schizophrenia

SIR,—I was interested to note in your report of Professor C. G. Jung's address on the psychogenesis of schizophrenia (April 15, p. 787) that he "concluded with the remark that medical psychology was a very one-sided affair." He alludes in the early portion of his lecture to Professor McDougall, with whom I was associated for a period during the war when he came from Oxford to Netley Hospital, hoping to be of service from a psychological point of view. After some months he returned to Oxford disillusioned. Not once but many times towards the close of his stay he said to me: "Medicine has nothing to learn from psychology nor psychology from medicine."—I am, etc.,

St. Mawes, Cornwall, April 18. B. H. SHAW.

Shock Therapy

SIR,—In reply to Dr. E. S. Caley's letter in the *Journal* of April 22 (p. 846), a book is being prepared for publication which will contain all the information he desires.—I am, etc.,

HORACE HILL, M.R.C.P.,
Salisbury, April 23. Medical Superintendent, Laverstock House.

Sturge's Disease

SIR,—I have read with great interest the article by Dr. A. M. Nussey and Dr. H. H. Miller on Sturge's disease (*Journal*, April 22, p. 822). The authors write: "The naevus is usually cavernous and flat, but frequently the skin over it is hypertrophied and raised, or even rough and nodular, partaking in an extreme instance (Greig, 1922) of the character of a sebaceous adenoma." I maintain that the condition of the facial skin in Greig's case, according to his account and excellent figure (*Edinb. med. J.*, 1922, **28**, 105), did not merely partake of the character of, but actually was a typical example of, so-called sebaceous adenoma of Pringle's telangiectatic type. In its colour (Greig mentioned that it became paler after loss of blood) and symmetrical distribution on the cheeks about the nose a better example could hardly be found anywhere to illustrate a work on tuberous sclerosis of the brain (Bourneville's disease, "epiloia"), of which it mostly constitutes a striking clinical feature. In Greig's account there is nothing to show that the patient, in addition to the "meningeal naevus," did not also have some degree of true tuberous sclerosis of the brain, or at all events the "sebaceous adenoma" component of Bourneville's disease. In other words, Greig's case may have constituted a hitherto unique instance of incomplete forms of Sturge's disease and Bourneville's disease overlapping one another in the same patient. Both diseases (I would prefer to say syndromes) belong to the class of what I would term developmental (congenital–developmental) tissue dysplasias. The "angiomata," "sebaceous adenomata," etc., which characterize this large developmental dysplastic class of abnormalities should be regarded not as true neoplasms but as *dysplastic pseudo-tumours*, analogous, for instance, to the so-called "fibromata," or minute "clumps" of dense connective tissue, often found in the renal medulla at post-mortem examinations; the tubules of the kidney are seen to pass through these "fibromata" on microscopical examination. Congenital or developmental dysplastic syndromes not rarely overlap or accompany one another in the same individual (the nature of a pathological lesion often throws light on the character of its companions in the same patient), and, apart from Greig's case, one is justified in prophesying that features of Sturge's syndrome and of Bourneville's syndrome will sooner or later be found to be associated in a single patient.

Is Sturge's disease potentially present in the fertilized ovum (zygote)? There is practically no known instance of its familial (hereditary) incidence, but even if a doubtful example can be adduced it would require more than one example to prove that the disease is present in the zygote, just as it takes more than one swallow to make a summer. If this congenital dysplastic condition is not already potentially present in the zygote, what is the nature of the process during relatively early intra-uterine life which causes it to appear?—I am, etc.,

London, W.1, April 23. F. PARKES WEBER.

Biological Pregnancy Diagnosis Tests

SIR,—Professor F. A. E. Crew (April 15, p. 766) has indeed earned our gratitude for so thoroughly testing the suitability of *Xenopus laevis* for pregnancy tests. Instead of the 20 to 1 concentration which he suggests as a standard method I am using 15 to 1 extracts with no appreciable difference in reliability. As for the question of "true" or "false" negative results, a negative should, I think, only be called "false" if the presence of an abnormally high level of gonadotropic hormone in the patient's urine had produced a positive reaction in a rabbit or a mouse. A negative result obtained simply because the test was done at a time when the hormone level was not yet sufficiently raised to elicit a reaction in a toad or a mouse should not be called "false" even should the patient subsequently be found to be pregnant. We test for the abnormally high level of gonadotropic hormone, not for the presence of a fertilized ovum, which we cannot detect if, for example, it is dead or too small yet to produce an appreciable amount of hormone. It would be interesting to learn at what age Professor Crew would suggest that a pregnancy can be tested for, either from the day of conception or from the first missed period. As for "false positives"—tests in which the toads ovulated and the patient proved not to be pregnant—I have not seen a single one in a series of 441 tests done on 2,619 animals. This may be due to the slightly weaker concentration I have used and to the fact that I never injected more than 1 c.cm. in each animal.

The question of whether ordinary urine or extracts should be used in a given case should, I think, be decided in accordance with the age of the suspected pregnancy and the specific gravity of the urine specimen. No absolute rules can be given, but the earlier the stage of the suspected pregnancy and the lower the specific gravity of the urine the more important it is to use extracts. I find it very helpful to put the patient on a dry diet from tea-time onwards on the day preceding the collection of the

specimen. This method yields heavier urines, which are more suitable for tests. Gynaecologists seem to agree now that lack or absence of gonadotropic hormone in early pregnancy indicates danger of impending miscarriage. While I agree with Professor Crew that the number of eggs laid by each toad cannot be interpreted in terms of "graded results," I have lately had reports in three cases on miscarriages in early pregnancy, following immediately on tests which had been negative. The reason for this pathological lack of gonadotropic hormone still remains obscure, but must probably be looked for in a congenital malformation of the trophoblast. It also seems as if the abundant production of gonadotropic hormone stops a few days before any outward signs of an impending miscarriage appear.

The economical advantage of the Hogben test would still be greater than it is already if somebody could be induced to breed *Xenopus laevis* in this country on a large scale. Given suitable accommodation it is not at all difficult to breed the toads at any time of the year, even in an unsuitable climate. Twenty young specimens, part of a batch of forty which I bred last autumn, are now on view at the aquarium of the Zoological Society, and approximately 200 xenopus tadpoles have so far hatched in my tanks this spring. It is difficult to bring up xenopus tadpoles in a laboratory mainly equipped for pregnancy tests, but if this test receives the popularity it deserves, frog-farming should become as remunerative as mouse-farming is now.—I am, etc.,

London, April 20. EDWARD ELKAN, M.D.

Yaws and Syphilis

SIR,—The clinical memorandum by Dr. K. W. Todd appearing in the *Journal* of April 22 (p. 827) contains a valuable observation, one which he believes greatly weakens the arguments put forward by Professor D. B. Blacklock in favour of the identity of yaws and syphilis. Dr. Todd says, "He [Blacklock] points out that we do not see secondary syphilis in young children, and that if we did it might, at any rate under tropical conditions, look like yaws." (I write from memory.) Professor Blacklock (*Ann. trop. Med. Parasit.*, 1932, **26**, 423) did not actually use such words, but he inferred very much the same thing. The possible fallacies in Blacklock's arguments were the subject of a paper by myself (*Empire Social Hygiene Year Book*, 1936) wherein I brought evidence to show that each of the two diseases always "bred true," and that the differential diagnosis rarely presented any difficulties if the case were considered as a whole. The primary lesion and the secondary eruption of yaws in native children are always characteristic. The value of Dr. Todd's observation lies in the fact, as stated by himself, that he was able on sight to make a correct diagnosis of a syphilitic skin eruption before finding the confirmatory evidence afforded by the presence of a typical Hunterian chancre on the infant's penis.—I am, etc.,

London, W.1, April 22. HUGH S. STANNUS.

Reaction to Whiff of Phosgene

SIR,—In reference to the unsigned statement you print under the above heading as having been received for publication from the Home Office (April 22, p. 847), it is a pity that an inquiry was not first directed to one of us who jointly had charge of the case. From the brief account submitted in the last issue it is inferred that there was no oedema of the lungs. This indeed on clinical signs was minimal, but the signs left no doubt that a change was going on in the mucosa of the smaller bronchioles. As the tendency to stridor subsided there occurred circulatory changes indicative of myocardial change, which made us take the precaution of keeping the patient in bed until the symptoms abated.

In regard to the suggestion that the symptoms were due to functional causes, we readily admit that a functional element of alarm may influence the clinical picture, but to suggest that the symptoms we observed were not due to serious disease is wide of the mark. We may mention that the patient was seen by several experienced medical men, none of whom was in doubt that the illness was the result of inhalation of phosgene.

At the request of Sir Joseph Barcroft we are submitting a full report to the Chemical Defence Committee, and we are also sending one to the Home Office.—We are, etc.,

A. G. GIBSON, M.D., F.R.C.P.
Oxford, April 24. M. C. RADFORD, M.D.

Admission to Hospital: An Erroneous Impression

SIR,—A patient and her sister came to see me privately this afternoon, both of them being quite poor people. The sister, whom I saw first, told me that the consultation was desired with a view to admission to the hospital to which I am attached. I then discovered that the patient was already attending as an out-patient at the hospital, and had been told that admission could not be arranged. I told the sister that under the circumstances I could not see my way to examining the patient. She expressed surprise at this, and said that at another large teaching hospital in their neighbourhood it was well known to be impossible to obtain admission to the ordinary hospital wards without seeing a doctor in Harley Street and paying his fee; and that they had thought it best, after having been turned down by the hospital physician, to beg, borrow, or get anyhow they could the three guineas that would secure admission by the private consultation route.

Now it is exceedingly unfortunate that such a highly damaging, and of course quite erroneous, impression should be current, even if it is confined to the poorer classes. How can we guard ourselves against it? It is clear that merely inquiring whether a private patient of the hospital class has already attended the hospital out-patient department before seeing him will not be sufficient precaution, if patients still retain the false impression that different standards are set for admission to the ordinary wards, according to whether the patient presents himself in the out-patient department or in the specialist's consulting-room. Admission to hospital, we all know, is determined by clinical considerations alone: but we must be very careful not even to give an *impression* that the way that is closed on medical grounds may be opened by what amounts to bribery. I enclose my card, and beg to remain—

London, April 17. "SPECIALIST."

The International Congress of Graphology will be held at Liége from September 16 to 19 under the auspices of the Belgian Water Exhibition. The executive committee of the Congress is mainly composed of psychologists, psychiatrists, neurologists, and educationists connected with the four Belgian universities, and its programme will relate for the most part to the possibilities of defining the scientific basis of this subject and its practical application in the spheres of education and of life generally. Further information may be obtained from the general secretary of the Congress, Madame Grundhout, 122, Avenue Emile Max, Brussels.

Obituary

A. R. GALLOWAY, M.B., C.M.

We regret to announce the death of Dr. Alexander Rudolf Galloway, for many years a leading ophthalmologist in Aberdeen, who had only lately resigned from the post of honorary ophthalmic surgeon to the Aberdeen Eye Institution after forty-one years' service. A son of James Galloway of Inverurie, he was born in Calcutta and received his medical education at the University of Aberdeen, where he graduated M.A. in 1884 and M.B., C.M. in 1888. After further study at the London Hospital he held for a time the post of clinical assistant at the Royal London Ophthalmic Hospital. At the Royal Infirmary, Aberdeen, he was assistant anaesthetist and assistant medical electrician before his election to the visiting staff of the Eye Institution in King Street. During the war he was one of the examining officers for Army recruits, and later a specialist member of the War Pensions Medical Board; he was also for nearly twenty years ophthalmic surgeon to Aberdeenshire schools and to the Aberdeen Asylum for the Blind, and lecturer in ophthalmology in the University.

Dr. Galloway joined the British Medical Association in 1890, and was vice-president of the Section of Ophthalmology at the Annual Meeting in Aberdeen in 1914. He was a past-president of the Aberdeen Medico-Chirurgical Society and a member of the Ophthalmological Society of the United Kingdom. He published papers on visual standard for recruits and on the estimation and correction of refractive errors in school children. For his war services he received the O.B.E. in 1920. One of his two sons is Lieutenant-Colonel R. W. Galloway, D.S.O., R.A.M.C.

Universities and Colleges

UNIVERSITY OF LONDON

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

The following candidates have been approved:

ACADEMIC POSTGRADUATE DIPLOMA IN PUBLIC HEALTH.—*Part I:* May E. M. Fleming, J. F. Houlihan, T. G. Martin.

UNIVERSITY OF GLASGOW

A graduation ceremony was held on April 22, when the following medical degrees were conferred:

M.D.—*Jane O. French, *J. H. Hutchison, †E. C. R. Couper, †T. Fletcher, †H. Smith, O. A. Ajose, R. W. Carslaw, S. R. Jamieson, G. B. Mair.

M.B., CH.B.—J. M. Bailey, E. McL. Barbour, P. H. Barkey, J. S. Binning, J. F. Bishop, J. Black, R. W. Bone, W. Briggs, C. E. Brown, F. B. Brown, D. M. Campbell, R. J. P. R. Campbell, Elizabeth K. R. Davidson, I. E. Dawson, W. Dougall, G. Fleming, Elizabeth H. B. Gardiner, G. Gerrard, J. R. Gibson, Alberta S. Gilmour, W. M. C. Gilmour, D. Glendinning, Matilda K. Godfrey, Mary R. Gray, A. McW. Green, J. L. Hamilton, W. Hamilton, T. Kane, D. C. Langwell, Sheila Latta, H. Lauder, L. F. McConnell, J. B. McEwen, J. Macfadyen, W. Macfarlane, A. Mack, Edith McKnight, Mary P. Maclean, D. G. MacNeill, A. L. McPheat, C. R. Marks, J. B. Miller, D. C. Moir, Marion H. Nicolson, R. O'Kane, Stella M. B. Perry, B. O. Porchetta, J. F. Shapiro, W. Sillar, R. H. Simpson, A. G. Sked, D. A. P. Stephen, H. S. Sweet, W. Tannock, A. P. D. Thomson, J. S. Walters, A. Wilson, R. Wyllie.

* With honours. † With commendation.

The following prizes, among others, were awarded:

UNIVERSITY PRIZES.—Bellahouston Gold Medals: J. C. Dick, T. J. Jones, W. T. W. Paxton. Straits Settlements Gold Medal for 1935, 1936, 1937, and 1938: M. Jackson.

SPECIAL CLASS PRIZES.—Surgery, Macleod Gold Medal: N. C. Scott.

Medical Notes in Parliament

Medicine Stamp Duty

In opening the Budget on April 25 Sir JOHN SIMON said that there was a troublesome question of long standing to which he proposed to give a final quietus. It was that of the medicine stamp duties. These duties had a long history, and the present law, which mainly dated back to 1812, had been described by a learned judge as a mass of confused and obsolete verbiage in which it was often difficult to decide which medicines were liable to duty and which were exempt. He might illustrate the archaic character of the legislation by quoting one of the exemptions which still applied on the statute book to-day. The exemption from duty extended to all drugs named and contained in the book of rates subscribed with the name of Sir Harbottle Grimston, Baronet, mentioned and referred to in the Act of Tonnage and Poundage made in the twelfth year of the reign of King Charles II. These were rather archaic duties, therefore, as he thought he had established.

A Select Committee of the House of Commons exhaustively examined the subject and produced a new scheme in which the main test of liability of medicine for taxation would be whether it was advertised or recommended in some form or other; but that tax, as it seemed to him, did not serve to relieve from tax all medicines of healing value. Even with the exemptions which the Select Committee proposed, a large number of genuine medicines would be brought under taxation. He had received many representations as to the objections to which a tax on these lines would be open, and it must be admitted that there would be real difficulties administratively. He had therefore reached the conclusion that the only satisfactory solution was to repeal the tax entirely, and he proposed to repeal the duty and the concomitant licence duty of 5s. payable by medicine vendors as from September 2 next. He suggested that date because, first, the licence normally ran till September 1, and it was desirable that the duty and the licences should terminate on the same date; secondly, it would give ample opportunity to the majority of the interests concerned to dispose of their stocks and adjust their prices to the new conditions. The cost would be £590,000 this year and £770,000 in a full year.

Dealing with films, the Chancellor of the Exchequer said that he proposed to put an excess duty on photographic films and plates manufactured in this country. *X*-ray films and dental films used for medical and scientific purposes would be exempt from any duty.

Nursing Services

On the motion to go into committee on the Civil Estimates Sir F. FREMANTLE called attention to the question of nursing services and moved: That this House, taking note of the report of the Interdepartmental Committee on Nursing Services, recognizes the inadequate supply of nurses to meet the increasing demand for their services and the urgent need for reform in their training, registration, and conditions of service both for institutional and domiciliary nursing. Sir Francis said there were 74,000 nurses on the general nursing register, and the supplementary part of the register of nurses for special purposes brought the total up to 90,000. Of these, 54,000 were qualified by examination. Recruitment at the present rate required 12,000 entrants for training each year. At the present time the shortage was obvious. In 1937 the London County Council, in an establishment of nearly 7,000 nurses in their general hospitals, had 611 vacancies for first-grade staff, and they filled up half that number by 300 extra first-year probationers. Most hospitals and institutions had a shortage of staff.

INCREASED DEMAND TO-DAY

The increased demand for nurses came from various factors. The accommodation of voluntary hospitals had increased in recent years by some 1,500 beds requiring the services of

500 nurses. Another factor was the increased public demand for hospital treatment of acute sickness. The development of medical technique and the special needs of *x*-ray and heat therapy also added to the need for nursing services. He estimated that 20,000 entrants to the nursing profession were required each year, or 8,000 more than at present, apart from future expansion. It had been suggested that by lowering the age of admission to the hospital wards a larger number of girls would be induced to become nurses who otherwise would get fixed up in other occupations. The secondary schools were the ideal source of recruitment for the higher standard of nursing which was aimed at, but though they might produce a larger output they could not supply anything like the large increase that was required. The upper grade of girls leaving the elementary schools was also a desirable source, and the second grade might supply girls who would qualify after experience and training. The question was how to fill the gap between the age of 15 and the age when they would enter the wards.

LONG HOURS AND UNDERPAYMENT

In regard to conditions of service many statements in the Press were exaggerated or exceptional. Most hospitals were trying to reduce hours, but were handicapped by a scarcity of recruits. Until hours were reduced that scarcity would continue. Somehow that vicious circle must be broken. The 96-hour fortnight was the utmost that could be achieved in the near future. The nursing profession was almost without exception opposed to the limitation of hours by statute.

It was necessary to dangle financial prospects before the recruit, and the younger probationers were given proportionately higher salaries. But nurses as a class, considering the responsibility of their work, were badly underpaid. Nursing salaries required revision, especially in the higher grades. The question of pensions was also unsatisfactory. With local authorities and voluntary hospitals competing for recruits there was need for recruitment to be considered on a national basis, and anything in the direction of a unified system would be an advantage. He asked the Minister to take the initiative in establishing something like the Burnham Committee of the teaching profession to deal with the question of the salaries of nurses.

Unreasonable rules and restrictions caused irritation and had a deplorable effect on recruiting, but the new rules for the L.C.C. hospitals were an example of enlightened reform. They all recognized the splendid devotion to duty and self-sacrificing loyalty of the nursing profession itself. Nurses were the inheritors of a great tradition. People had traded too long on their goodwill. Now it was a duty to give them the conditions essential for the service under the changed conditions of to-day.

UNIVERSAL SUPERANNUATION

Colonel PONSONBY, seconding the motion, said the committee had recommended a number of changes in conditions, but those who were interested in the recruitment of nurses ought not to emphasize too much the question of conditions. They were being improved, and would be improved still more. The cost of making large increases in the nursing staffs of voluntary hospitals would fall on the generous supporters of the voluntary hospitals, and in the case of municipal hospitals the cost would be extracted from unwilling ratepayers. It was essential to make the nursing services homogeneous, but the result of the difference between the superannuation arrangements in voluntary and municipal hospitals was that there was no free transfer between the two. He was glad to see that the committee said that pensions for nurses should, so far as possible, be universal and interchangeable between all branches of the service, and recommended that discussions should take place between the parties interested without delay. If the nursing service was to be national it was essential that the superannuation scheme should be national also.

NINETEENTH CENTURY RESTRICTIONS

Miss MEGAN LLOYD GEORGE said she hoped the Minister would not wait for the publication of the full report before he implemented some of the recommendations of the committee. The existing nineteenth century irksome restrictions deterred twentieth century girls from joining the profession. But the chief troubles were the scandalously long hours and the low salaries. By comparison with other occupations the nursing profession had seen very small improvement in regard to hours of work. She hoped that the Minister would set up as soon as possible the salaries committee suggested by the Interdepartmental Committee. From a financial point of view hospitals could not be run efficiently on a voluntary basis.

Dr. EDITH SUMMERSKILL said that the provision of an adequate supply of nurses was an important branch of civil defence. One of the most important recommendations in the interim report was that nurses should be allowed to live out. To enable them to do this they should be better paid so that they could get proper accommodation. The second point was that still in our hospitals a nurse, after having undergone an arduous training of four years, must, if she decided to marry, resign her position. Was there ever such stupid waste of excellent material? There was now the anomalous situation arising out of the appeal to women—single, married, or widows—to join the Civil Defence Nursing Service. It meant that these 100,000 young women would have a very short training in the hospitals, and young married women would be working—it was true, on a temporary basis—beside fully qualified nurses who dare not announce their intention to marry.

MINISTER'S REPLY

Dr. ELLIOT said the Government did not intend deferring all action until the final report of the committee was delivered. The three reports on nursing services—the Athlone report for England and Wales, and the Black and Alness reports for Scotland—were on common ground in stressing that the nurse's devotion to duty should be adequately rewarded as regards remuneration and conditions of service. The Government accepted these general conclusions. The shortage of nurses arose from the increased demand, and not from any falling off in the numbers of entrants to the profession. Roughly the number of nurses qualifying in Great Britain had risen in ten years from 6,000 to 10,000. The increase had not been great enough. Present methods of recruitment were ill fitting to the educational system of the country. An unfortunate gap existed between school-leaving age and age of entry into hospital. Education Departments were considering how best to organize suitable forms of preliminary training both for elementary and secondary school girls which would fit in with the proposed division of the preliminary State examination into two parts. The General Nursing Council had submitted a rule to him to enable this "splitting" to be effected and this rule would be approved. This "splitting" had already been effected in Scotland.

There was much scope for improvement in conditions of service, though many accusations were exaggerated. The Government was prepared to accept the view expressed by the Athlone and Alness Committees that the conditions of service of the nursing profession so far as they affected discipline, leave, amenities, and so forth should be based "on the conception of a nurse as a reasonable adult anxious to live up to the high traditions of service for which the nursing profession in this country is justly famous." Accordingly Mr. Colville and he proposed to issue a circular to local authorities on the numerous administrative recommendations contained in the reports and to ask the British Hospitals Association whether it would be willing to issue a circular in similar terms to the voluntary hospitals. Certain of the recommendations in the Athlone and Alness reports involved finance, and the Government was giving careful consideration to the whole question. He hoped it would be possible to say more about this matter at a reasonably early date.

NURSING SERVICES IN WAR-TIME

He had already explained to the House the general plan of hospital bed expansion in the event of war. In round figures the position for Great Britain was 200,000 beds in the first

twenty-four hours. These were to be beds in existing hospitals for which nursing staff was for the most part already provided; 100,000 additional beds were to be placed in existing hospitals, etc., for which staff was not at present provided. To supplement these beds they were arranging for a programme of hutted annexes attached to existing hospitals. The first block of these hutted annexes has been arranged for, a block of 26,000 beds—20,000 for England and Wales and 6,000 for Scotland. The total of beds for which staff would have to be provided was some 120,000. At one nurse to three patients the staff required for this programme alone was 40,000 nurses and nursing auxiliaries. Nurses and auxiliaries were also needed for first-aid posts and for helping to look after evacuated children and others from the congested areas, etc. They were therefore asking for 100,000 women now. Local authorities had power to incur any reasonable expenditure on training, and no expense need fall upon the recruit.

Criminal Justice Bill

The Standing Committee of the House of Commons which had been considering the Criminal Justice Bill completed, on April 20, its examination of this measure. Proposed new clauses were then considered.

Sir DONALD SOMERVELL moved a new clause dealing with the temporary treatment of probationers required to submit to treatment for mental conditions. He said that the new clause would apply where a probationer was undergoing treatment as a non-resident or as a resident patient in an institution specified in an order under the Bill, but in course of time it became desirable that the person should receive treatment in some other institution than that named in the order. That other institution might not be a general hospital or of a general medical character. The new clause would provide that the person might receive treatment in the other institution provided that he consented and that it was recommended by the medical practitioner in whose charge he was. Sir SAMUEL HOARE gave an assurance that the hospitals or institutions mentioned in the new clause did not mean an institution belonging to the Board of Control. The clause, he said, had nothing to do with the Board of Control.

The clause was read a second time and added to the Bill.

Mr. BENSON brought up a proposed new clause to provide that for a period of five years after the coming into force of the Bill sentence of death should not be pronounced or recorded. He said murder was a crime of emotion and lack of balance. Nearly 50 per cent. of murderers committed suicide immediately after the murder; nearly half the remainder were found, during the proceedings, to be insane. Sir SAMUEL HOARE said that in a capital case where there might be a question of insanity the Home Secretary had the help of his medical experts. A medical examination invariably took place in such cases. Except in the case of infanticide it had been found practically impossible to find a legal dividing line between one type of murder and another. If capital punishment was to be abolished or suspended that should be done after full consideration of a Bill devoted to that proposal. He was not prepared to advise the experiment which Mr. Benson proposed.

The new clause was rejected by 16 to 7.

Mr. HARVEY brought up a new clause to authorize the provision by the Home Secretary of approved schools for reception of children requiring prolonged mental treatment but whose condition did not justify their certification as persons of unsound mind under the Lunacy and Mental Treatment Acts, or as mental defectives under the Mental Deficiency Acts. Mr. Harvey said he moved the clause at the instance of the Institute of Child Psychology. Sir DONALD SOMERVELL resisted the proposal and the clause was withdrawn.

Answering Mrs. Hardie, Sir SAMUEL HOARE said he believed the courts already had power to send a high-grade feeble-minded child to an approved school instead of to a certified institution.

Drafting amendments were made in the Bill and it was ordered to be reported to the House.

Casualty Services in War

On April 24 the House of Commons considered the Civil Defence Bill in committee. Dr. HADEN GUEST moved to delete Subsection (3) of Clause 1, which provides that the Minister may make arrangements for the exercise on his behalf of any of his functions under the Act of 1937 or the present Act by any other Minister of the Crown. Dr. Guest said his object was to secure unified control of the civil defence services. The present division of functions between the Lord Privy Seal, the Minister of Health, and the Minister of Transport led to a certain amount of disunity. Serious conflict was arising in the organization of the casualty services. It was vital that those services should be co-ordinated and thoroughly efficient; otherwise not only would very great suffering be caused to the injured but the whole of the civil defence system would be disorganized. At present air raid posts were under the Ministry of Health, stretcher bearers under the Lord Privy Seal, and ambulances under the Minister of Transport.

As a medical man he had been very seriously perturbed at this dispersal of control, and the matter had been brought to his attention by a number of people. One of the bodies perturbed at the situation was the Metropolitan Boroughs Standing Committee. It was the considered opinion of the medical officers of health of the metropolitan boroughs that under the present system of recruitment and training and conditions of service, the efficient functioning of the casualty services either in peace or war was impracticable. He (Dr. Guest) urged that the Lord Privy Seal should present a definite plan for the allocation of the services as between himself and the other Ministries. It might be advisable to appoint an advisory council or board, consisting partly of members of Parliament, partly of members of local authorities, and partly of representatives of the different Ministries, for this purpose.

Sir JOHN ANDERSON said that the subsection was necessary for two reasons: (1) to regularize what had already been done; and (2) to provide for certain contingencies that might arise in future. At present he was responsible primarily for all matters of policy in connexion with civil defence. He had made it clear from the beginning that if the work was to be done in a reasonable time the burden must be spread, while at the same time effective arrangements must be made to ensure that one Minister was in a position to dominate policy. As to risk of confusion, might not the confusion be much greater if he attempted to set up, under his direct control, a new Department to deal with railways, docks, electricity, and transport, when there was already a Department with all the necessary technical resources at its disposal?

Similarly in regard to casualty services. The Bill proposed to entrust the Minister of Health with responsibility for the organization of hospital services. The responsibility for first-aid posts was to be transferred to the Minister of Health by way of delegation under this subsection. Last September the responsibility for first-aid parties and posts was with the Home Office, but that experience clearly showed that that was not an effective division of responsibility. The responsibility for first-aid posts should rest where the responsibility for hospitals rested. There had been a demand from the metropolitan boroughs that the responsibility for first-aid parties should be added also. The Ministry of Health and his own Department had been in complete agreement throughout that the proper division of responsibility was the one now made, which left the responsibility for first-aid parties under his control and transferred that for first-aid posts to the Minister of Health. The reason was that first-aid parties were street parties, and must be organized so that they could collaborate effectively with other street parties, police, and fire brigades. If they were to avoid confusion there should be some finality. When a decision had been reached after full consideration it should be adhered to. Nothing but confusion could result from trying repeatedly to get it altered. As a matter of organization his advisers and those of the Minister of Health were satisfied that the decision should stand.

The amendment was negatived by 191 to 110, majority 81.

Medical News

The annual banquet of the Harveian Society of London will be held on Thursday, June 8, at 7.30 p.m., in the Connaught Rooms, Great Queen Street, W.C. The address of the honorary secretaries is 14, Devonshire Street, Portland Place, W.1.

"Chemotherapy and the Public Health" and "Partial Activated Sludge Treatment of Sewage" are to be discussed at a sessional meeting of the Royal Sanitary Institute at the Mechanics' Institute, Burnley, on Friday, May 12, at 4.45 p.m. The first subject will be introduced by Dr. G. A. Cary Lynch and the second by Mr. J. L. Beckett.

The fifteenth scientific meeting of the American Heart Association will be held at Hotel Jefferson, St. Louis, Missouri, on Friday and Saturday, May 12 and 13. The first day will be devoted to discussions on general cardiac diseases, and the second to the study of the peripheral circulation. There will also be a heart symposium under the joint auspices of the American Heart Association and the American Medical Association.

The ninth spring meeting of the Sussex Medical and Dental Golfing Society will be held on the links of the Goring Hall and Ham Manor Golf Club, Angmering, on Sunday, May 7.

The University College (late Queen's College), Galway, North of England and Midlands Alumni Association will hold its thirteenth annual medical reunion at the Midland Hotel, Peter Street, Manchester, on Saturday, May 6, at 7.30 p.m.; dinner at 8 p.m. The subscription is one guinea, which includes the dinner, cost of organization, printing, etc., and all Galway graduates are invited. Those who intend to be present are asked to notify the honorary secretary, Dr. P. J. Webb, 155, Rochdale Road, Blackley, Manchester, 9.

We have been asked to draw the attention of readers to the fact that the skin clinic of the Hospital for Sick Children, Great Ormond Street, W.C., was changed some time ago from Wednesday morning to Tuesday afternoon at 1.30 p.m. Although two years have elapsed since the alteration was made, numerous cases still arrive on the wrong day, with the consequent embarrassment to the staff, apart from the inconvenience and unnecessary expense to which the parents themselves are put.

The third Congress of Applied Pathology will be held in Rome from May 15 to 20 under the presidency of His Excellency Pietro Rondoni of the Academy of Italy. There will be an exhibition of books relating to the medical, veterinary, and botanical aspects of the subject, and authors are invited to send copies of their publications. Further information may be obtained from Dr. Vittorio Amadasi, Via Vittorio Veneto 34b, Rome.

After sixteen years of steady progress and of increasing assistance to subscribers faced with serious illness the executive council of the British Provident Association is now introducing a further benefit for ordinary subscribers who desire to have the advantage of it. This is a scheme for the provision of a grant-in-aid towards the fees of the family doctor. It will be clear that a moderate annual voluntary subscription cannot hope to cover the whole of fees for general practitioner treatment, but this scheme does much towards provision for such outlay. For a small extra premium the B.P.A. will make a grant-in-aid up to £35 in respect of any one patient in any subscription year, provided that the subscriber bears the first fifty shillings of the doctor's account, and that the illness of any dependant under the age of 5 years is not covered. Details can be obtained by writing to the Manager, B.P.A., 30, Lancaster Gate, London, W.2.

In our advertisement columns this week applications are invited for the post of Professor of Physiology and Registrar at the Ceylon Medical College. The salary attached to the post is £1,150 per annum.

In the *Journal* of April 22 (p. 852) we announced two lectures to be given by Dr. A. Hrdlicka on the racial fallacies and realities of European peoples, at University College, Gower Street, W.C., on April 26 and 28. Owing to the illness of Dr. Hrdlicka both lectures have been cancelled.

The King has appointed Dr. Charles Norman Griffin to be an Official Member of the Executive Council of the Presidency of Dominica for a further period.

Professor Pasteur Vallery-Radot of the Paris Faculty of Medicine has been sent to French Equatorial Africa and the Cameroons to study the general organization of native medical services.

Professor Max Nonne, formerly director of the Neurological Clinic at the University Hospital of Hamburg-Eppendorf, has been nominated a corresponding member of the Swiss Neurological Society.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

A general rise in the notifications* of the majority of acute infectious diseases in this country has been observed during the week under review. The recorded rise may be partly an artificial one, due to the inclusion of cases which were not notified during Easter week. The increases are most notable in pneumonia (primary and influenzal) 1,304 (1,161), scarlet fever 1,700 (1,568), diphtheria 845 (755), puerperal fever 231 (180). In London increases were recorded only in respect of diphtheria and scarlet fever, and these were comparatively small; but in Manchester, Birmingham, and Liverpool appreciable increases were recorded in respect of all four diseases, with the exception of pneumonia in Liverpool. In London whooping-cough and measles both showed an increase, but in Scotland there was an appreciable fall. In all four countries and in London fewer deaths from whooping-cough were recorded, while deaths from measles showed an increase, with the exception of London, in which there were no deaths in either week.

The figure for puerperal pyrexia—231 (180)—is the highest in the last two years, in which the average has been 160.5. Areas with large numbers of cases are Liverpool 19 (9), 6 each in Edmonton (1) and Sheffield (3), and 5 each in Derby (1) and Newcastle (3). In London notifications fell from 26 (excluding 4 cases of puerperal fever) to 18. It is possible that the figures, which are not corrected for errors of diagnosis, have been inflated by the inclusion of cases suffering from influenza during the puerperium.

Scarlet Fever in 1938

In a review in the *Weekly Epidemiological Record* of the Health Section of the Secretariat of the League of Nations on scarlet fever morbidity it is shown that the fluctuations in the prevalence of the disease have been as great from year to year in the 1928–38 period as in the previous ten years. For instance, during the early months of 1939 the incidence was markedly lower than the median in the U.S.A., England, Poland, and Hungary, while in Germany during the first three four-week periods of 1939 it approached the maximum for the same period of the years 1926–36. There has been a general decline in incidence since 1934 in England, the Netherlands, and Hungary, since 1935 in the United States, and since 1936 in Germany, Rumania, Ireland, Finland, and Australia. As regards mortality the disease was shown to be less fatal than in the previous ten years, the death rate being below 3 per 100,000 population in the countries of Northern, Western, and Central Europe, and fluctuations were less wide than formerly. Such fluctuations as were observed, however, did not occur at the same time or to the same degree in different countries and not even in neighbouring countries.

* Except where otherwise mentioned, figures in parentheses refer to the week preceding the one under review.

No. 15

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 15, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	34	1	16	3	1	30	6	10	2	4		
Deaths		2	—				2	—				
Diphtheria	845	98	165	43	14	1,056	133	192	54	30	995	137
Deaths	20	1	5	2	1	29	2	4	3	1		
Dysentery	18	8	18		1	76	19	33		—		
Deaths				—	—			1	—	—		
Encephalitis lethargica, acute	3	—	—	1	—	5	—	—		—		
Deaths		1					1	—				
Enteric (typhoid and paratyphoid) fever	11	2	11	12	—	29	1	5	2	—	25	
Deaths	1	—	—	—	—	1	—	—	—	—		
Erysipelas			70	6	7			44	10	2		
Deaths		1					1					
Infective enteritis or diarrhoea under 2 years												
Deaths	63	9	5	4	8	37	10	8	4	3		
Measles		43	90		3			724		24		
Deaths	9	—	1	4	—	54	14	33	1	4		
Ophthalmia neonatorum	86	6	27		1	80	8	21		—		
Deaths												
Pneumonia, influenzal*	1,304	119	9	2	10	847	70	7	1	1	1,155	111
Deaths (from influenza)	127	18	7	—	1	52	4	5	—	1		
Pneumonia, primary			227	15				191	9			
Deaths		19		16	8		22		20	13		
Polio-encephalitis, acute	1	—				—	—					
Deaths		—					—					
Poliomyelitis, acute	3	—	1		—	3	1	1		—		
Deaths		—					—	—				
Puerperal fever	—†	—	10	2	—	4†	4	5		—		
Deaths		—					1‡					
Puerperal pyrexia	231	18	22		2	156	14	20		4		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,700	151	248	49	56	1,841	166	356	91	78	1,862	231
Deaths	2	1	—	—	—	6	—	1	—	1		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—			—	—	—		
Whooping-cough		402	190		19			67		11		
Deaths	21	3	4	—	1	21	2	—	1	—		
Deaths (0–1 year)	403	61	75	26	23	373	62	73	32	19		
Infant mortality rate (per 1,000 live births)	63	52				62	51					
Deaths (excluding stillbirths)	5,559	1,020	707	207	159	4,680	848	635	188	147		
Annual death rate (per 1,000 persons living)	13.7	13.0	14.3	13.9	14.0	11.5	10.7	13.0	12.7	13.0		
Live births	6,132	1,037	1,055	276	212	5,919	1,030	878	305	233		
Annual rate per 1,000 persons living	15.1	13.2	21.4	18.6	18.6	14.6	13.0	17.9	20.6	20.7		
Stillbirths	235	35	37			258	51					
Rate per 1,000 total births (including stillborn)	37	33	34			42	47					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Life Assurance Relief

"J. H." has recently taken out policies with the Medical Sickness Annuity and Life Assurance Society and the Legal and General Assurance Society for pension benefits or capital sums. The policies mature at 65 years of age. The local tax inspector questions the title to relief.

*** If, as is assumed, the contracts have been made under the scheme known as the National Health Insurance Practitioners' Pension and Insurance Scheme, the premiums *are* admissible for the relief. The fact should be shown by the tax inspector's official records.

Loss on Removal to New Premises

"M.B." has hitherto had his surgery, etc., away from his residence. He is now having a house built to provide both professional and residential accommodation, and will then sell his former house. Can he claim an allowance for the loss that that sale will entail?

*** No. The transaction is of a capital nature, and neither profit nor loss enters into his income-tax liability as a medical practitioner. He can, of course, claim the cost of the removal of the professional equipment to the new premises, and the dilapidations (if any) payable in respect of the former professional premises.

Sale of Practice

"J. A. K. G." has sold his practice and is retiring on April 9, 1939. (1) Is he liable for the second instalment of tax assessed for 1938–9 and due on July 1, 1939? (2) Will he be liable for any further tax? His accounts have always been made up for the year to December 31 on the basis of cash receipts.

*** (1) Yes. He was in receipt of the earnings for the whole of the year ending April 5, 1939, and must pay the whole of the tax assessed for that year. (2) Strictly he will be liable to account for tax on the earnings of the four days to April 9, 1939, as part of his income for 1939–40. (Having regard to the incidence of the Easter holidays this may well be negligible.) The Revenue authorities are entitled to call for a statement of his profits for the period January 1 to April 5, 1939; if his profits for the actual year to April 5, 1939, are found to exceed the assessment made for that year (on the basis of the year to December 31, 1937) an additional assessment can be made to tax the difference. Cash received after April 9, 1939, is not liable to assessment.

LETTERS, NOTES, ETC.

Unusual Fatal Accident

Dr. M. C. S. LAWRANCE (Earlestown, Lancs) writes: The following unusual fatal accident may be of interest. A man working here at the L.M.S. wagon works was walking backwards carrying a sole bar with another man when he caught his foot in an obstruction and fell in a sitting posture, the sole bar catching him in the abdomen. He got up and resumed work for an hour and then went into the lavatory, which was really a urinal. As he did not return after a considerable time his mate went to look for him, and found him lying on his face, unconscious and making a grunting noise. He was then taken to the ambulance room, and the nurse telephoned me, but he was dead when I got there. He had a bruise on his forehead which had been caused by falling against an iron pipe which was in the urinal. The coroner ordered a post-mortem examination, and it was found that the cause of death was a fracture-dislocation of the vertebral column, the skull and the atlas being dislocated forwards an inch on the axis, the odontoid process of which was broken off. Obviously, when he fell in the urinal he must have caught his forehead against the pipe and so broken his neck. It is also probable that carrying him into the ambulance room did not improve matters.

Medical Students in War-time

"SURGEON COMMANDER, R.N.V.R.," writes: In its wisdom the Government has scheduled the medical students as a reserved occupation. It should not pass the wit of the authorities to devise some scheme whereby the medical student could satisfy his desire to stand by his friends in other walks of life who are risking their lives in the defence of their country, and at the same time continue his studies. During the last war many hundred students served as surgeon probationers, R.N.V.R., in destroyers and sloops. For some it was waste of time; for others, including myself, it was a wonderful experience and one that I would not have missed for anything. As a surgeon probationer I had to learn for myself all about naval etiquette, discipline, ship's routine, hygiene, tradition, etc. No one attempted to teach me. I would suggest that surgeon sublieutenants, R.N.V.R., should be appointed to destroyers, and that the P.M.O. should be a man who himself served as a surgeon probationer in the last war. He should make it his duty to give lectures in the forenoon to all surgeon sublieutenants in port on the subjects mentioned above. At the same time he could demonstrate interesting cases and lecture on medicine and surgery as applicable to the Naval Service. A similar scheme could doubtless be worked out for the Army. Students would thus serve their country and at the same time gain invaluable experience in handling men and meeting emergencies unaided. Many students gave up their studies and joined combatant units and were lost to medicine after the war. Let the students serve in a medical capacity and let their superior officers report every three to six months as to whether they should be allowed to continue their service or be made to go back and resume studies at home. Time lost (if any) would then be reduced to a minimum and the student who served would be the gainer.

Dead Foetus in Utero

Dr. D. C. OZA (late chief medical officer, Morvi, India) writes: Two months ago a Kisan woman aged 30, a multipara, came with a complaint of agonizing pain in the uterine region. She said it was due to a tumour having formed, subsequent to haemorrhage a month ago, at a time when she was nearly four months pregnant. The woman was in severe pain. On palpation the uterus was as hard as a myoma of the size of an ordinary coconut. The pain started after the haemorrhage, and it had increased progressively without further bleeding; on vaginal examination a central placenta praevia was found, the cervix admitting the index finger without any bleeding from the part. This was in fact a curious case in which after the first haemorrhage expulsion of the foetus was held up, with the onset of severe progressive pain but without recurrent bleeding. The foetus must have died after the first haemorrhage. Morphine and pituitrin were given hypodermically in the evening. The morphine enabled the patient to rest until after midnight, and the true pains delivered the dead foetus of nearly six months by 8 o'clock next morning. She then completely recovered without mishap.